.5:1056/4 Engin 260

Vol. 1056 Number 4

The University of Michigan Engineering Library

SEP 19 1985

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

July 23, 1985

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

July 23, 1985 Volume 1056 Number 4

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1056 OG 50
Notice of Maintenance Fees Payable	1056 OG 50
Reissue Applications Filed	1056 OG 50
Requests for Reexaminations Filed	1056 OG 51
Service by Publication	1056 OG 51
Notice of Availability for Licensing	1056 OG 51
Errata	1056 OG 52
Patent Certificates of Correction	1056 OG 53
Disclaimers	1056 OG 53
Dedications	1056 OG 53
Disclaimers and Dedications	1056 OG 53
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1056 OG 54
Condition of Patent Applications	1056 OG 55
Reissue Patents Granted (31,952)	1479
Plant Patents Granted (5,518)	1481
Patents Granted	
General and Mechanical (4,530,111)	1483
Chemical (4,530,699)	1687
Electrical (4,531,015)	1779
Design Patents Granted (279,725)	1857
Index of Patentees	PI 1
Indices of Reissue, Design and Plant Patentees	PI 43
Classification of	
Patents (Including Reissues)	PI 47
Designs and Plants	PI 49
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 50
Designs and Plants	PI 51
Change of Address Form and Subscription Order Form	Back Page

THE UNIVERSITY OF MICHIGAN
SEP 19 1985
ENGINEERING LIBRARY

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of May 7, 1985 and was published in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

International PCT fees were changed effective May 28, 1985 and were announced in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	620.00
International fees	
Basic fee (first 30 pages)	230.00
Basic Supplemental fee (for each page over 30)	4.00
Designation fee (for the first 10 national or regional offices)	55.00
Designation fee for 11th and subsequent designations	No charge

May 7, 1985.

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on July 20, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,339,830 through 4,340,975

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,199,774, Re. S.N. 539,111, Filed Dec. 5, 1983, Cl. 357/41, MONOLITHIC SEMICONDUCTOR SWITCHING DEVICE, James D. Plummer, Owner of Record: *The Board of Trustees of the Leland Stanford Junior University,* Attorney or Agent: Paul D. Flehr, Ex. Gp.: 253

4,388,076, Re. S.N. 742,286, Filed June 7, 1985, Cl. 604/165, INTUBATING DEVICE, William E. Waters, Owner of Record: *Biosearch Medical Products, Inc., Raritan, N.J.,* Attorney or Agent: Charles R. Hoffmann, et al., Ex. Gp.: 336

4,388,509, Re. S.N. 743,202, Filed June 10, 1985, Cl. 200/157, SYNTHETIC-RESIN AND METALLIC LAYERED HOUSING FOR HAND-HELD APPLIANCE, Roland Ullmann, et al., Owner of Record: *Braun A.G., Frankfurt/Main, Germany,* Attorney or Agent: Scott R. Foster, et al., Ex. Gp.: 243

4,467,498, Re. S.N. 725,241, Filed Apr. 24, 1985, Cl. 17/045, ROTARY VISCERA HARVESTER, Johnny R. Graham, et al., Owner of Record: *Cantrell Machine Co., Inc., Gainesville, Ga.,* Attorney or Agent: Julian W. Dority, et al., Ex. Gp.: 327

4,505,270, Re. S.N. 743,052, Filed June 10, 1985, Cl. 128/088, FLUID ADMINISTRATION SPLINT, Betty J. Miles, Owner of Record: *Inventor,* Attorney or Agent: Maurice L. Miller, Jr., Ex. Gp.: 336

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Service by Publication

A petition to cancel the registrations identified below have been filed, and the notice of such proceeding sent by registered mail to the registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assign or legal representative, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Forrest D. Hill, d.b.a. Hereford Produce Co., Hereford, Tex., Reg. No. 859,770, for the mark "PIONEER AND DESIGN", Canc. No. 14,449.

ERMA S. BROWN,
Administrator
Trademark Trial and
Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

U.S. GOVERNMENT-OWNED INVENTIONS
Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Federal Patent Licensing
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Office of Federal Patent Licensing
National Technical Information Service
U.S. Department of Commerce.

DEPARTMENT OF AGRICULTURE

SN 6-407,232 (4,505,277). IMPLANTATION DEVICE FOR USE IN VIVO STIMULATION AND COLLECTION OF MONOCYTES FROM PERITONEUM OF VERTEBRATE.

SN 6-475,784 (4,503,082). METHOD FOR REDUCING SODIUM CONTENT AND SIMULTANEOUSLY INCREASING POTASSIUM CONTENT OF A FOOD.

SN 6-696,566. MULTI-PRODUCT WOOD PROCESSOR.

DEPARTMENT OF COMMERCE

SN 6-732,327. HARDWARE INTERPRETER FOR FINITE STATE AUTOMATA.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

SN 6-386,991 (4,511,556). INACTIVATION OF A LIPID VIRUS.

SN 6-468,776 (4,502,475). DRILL GUIDE FOR BONE PLATE FIXATION.

SN 6-675,617. IMPROVED POLYETHYLENE GLYCOL (PEG) REAGENT.

SN 6-705,709. ANTIINFLAMMATORY 2,3-DIDEMETHYLCOLCHICINE AND DERIVATIVES.

SN 6-715,332. RAPID BIOASSAY AND A KIT FOR PEPTIDE HORMONES.

SN 6-717,624. FUNCTIONALIZED CONGENERS OF ADENOSINE RECEPTOR AGONISTS.

SN 6-717,692. HUMAN SCLC AUTOCRINE GROWTH FACTORS AND MONOCLONAL ANTIBODY BLOCKING THE SAME.

DEPARTMENT OF THE AIR FORCE

SN 6-382,070 (4,506,269). LAMINATED THERMOPLASTIC RADOME.

SN 6-418,113 (4,438,006). PERFLUORINATED ALIPHATIC POLYALKYLETHER LUBRICANT WITH AN ADDITIVE COMPOSED OF AN AROMATIC PHOSPHINE SUBSTITUTED WITH PERFLUOROALKYLETHER GROUPS.

SN 6-539,603 (4,504,329). PROCESS FOR THE EPITAXIAL DEPOSITION OF III-V COMPOUNDS UTILIZING A BINARY ALLOY AS THE METALLIC SOURCE.

SN 6-664,197. ENERGIZING ARRANGEMENT FOR CHARGE COUPLED DEVICE CONTROL ELECTRODES.

SN 6-689,115. APPARATUS FOR NON-DESTRUCTIVE INSPECTION OF BLIND HOLES.

SN 6-698,720. VARIABLE CYCLE ENGINE FOR HIGH ALTITUDE AIRCRAFT.

SN 6-711,936. PLASMA SPRAY SCREEN REPAIR METHOD.

SN 6-713,666. LIGHT-WEIGHT OXYGEN DELIVERY HOOD ASSEMBLY FOR HYPERBARIC CHAMBER.

SN 6-716,729. DIELECTRIC RESONATOR OSCILLATORS WITH DIGITAL TEMPERATURE COMPENSATION.

SN 6-720,936. VERY HIGH SPEED LAP WITH NEGATIVE LIFT EFFECT.

SN 6-720,937. VERY HIGH SPEED LAP WITH POSITIVE LIFT EFFECT.

SN 6-721,833. CPTICALLY PUMPED LASER SYSTEM HAVING EXTRACAVITY PULSE SMOOTHER.

SN 6-721,834. DIELECTRIC RESONATOR STABILIZED MICROSTRIP OSCILLATOR.

SN 6-721,968. METHOD OF MEASURING SPHERICAL ABERRATION AND APPARATUS THEREFOR.

DEPARTMENT OF THE ARMY

SN 6-361,655 (4,388,146). ANALOG CORRECTION OF QUARTZ RESONATOR OF ANGLE CUT.

SN 6-361,657 (4,389,275). QUARTZ RESONATOR ANGLE CORRECTION.

SN 6-386,828 (4,489,392). ORTHOGONALIZER FOR INPHASE AND QUADRATURE DIGITAL DATA.

SN 6-732,120. MICROWAVE BANDSTOP FILTER.

SN 6-733,836. INTEGRATED DUAL BEAM LINE SCANNING ANTENNA AND NEGATIVE RESISTANCE DIODE OSCILLATOR.

ENVIRONMENTAL PROTECTION AGENCY

SN 6-422,941 (4,507,762). METHOD AND APPARATUS FOR GENERATING MONOPULSE ULTRASONIC SIGNALS.

Errata

"All reference to Patent No. 4,514,124 to Josef Theurer of Austria for 'MOBILE MACHINE FOR REMOVING SURFACE IRREGULARITIES FROM A RAIL HEAD OF A RAILROAD TRACK' appearing in the Official Gazette of Apr. 30, 1985, should be deleted since no patent was granted."

"All reference to Patent No. 4,524,069 to David T. Rovee, et al. of Somerset, N.J. for 'TOPICAL ANTI-INFLAMMATORY DRUG THEREAPY' appearing in the Official Gazette of June 18, 1985 should be deleted since no patent was granted."

"All reference to Patent No. 4,526,994 to Ulrich Nieballa, et al. of Germany for '2-AMINO-1-(1,3-DIOXOLAN-4-YL)-ETHANOL COMPOUNDS, THEIR PREPARATION AND USE' appearing in the Official Gazette of July 2, 1985, should be deleted since no patent was granted."

PATENT NOTICES

Certificates of Correction for the Week of July 23, 1985

Re. 31,839	4,472,100	4,489,528	4,500,374
D. 271,526	4,473,378	4,489,871	4,501,508
D. 276,899	4,473,443	4,490,208	4,501,729
D. 277,907	4,473,455	4,490,265	4,502,451
4,201,716	4,473,493	4,490,479	4,502,729
4,298,000	4,474,847	4,490,882	4,503,266
4,320,834	4,474,904	4,491,603	4,503,519
4,322,956	4,476,109	4,491,625	4,503,701
4,352,971	4,477,040	4,492,535	4,503,988
4,370,958	4,477,709	4,492,743	4,504,014
4,383,435	4,478,296	4,492,849	4,504,215
4,383,504	4,478,412	4,492,969	4,504,229
4,390,265	4,478,481	4,493,171	4,504,680
4,394,758	4,478,580	4,493,957	4,505,076
4,410,922	4,479,439	4,494,215	4,505,115
4,411,617	4,479,814	4,494,403	4,505,636
4,412,400	4,480,274	4,494,532	4,505,831
4,415,103	4,480,277	4,494,960	4,506,481
4,419,610	4,481,850	4,494,994	4,506,648
4,431,504	4,482,821	4,495,197	4,506,698
4,433,809	4,483,985	4,495,369	4,507,165
4,441,904	4,484,531	4,496,083	4,507,229
4,446,298	4,484,631	4,496,255	4,507,538
4,453,505	4,485,029	4,496,580	4,507,979
4,454,775	4,485,315	4,496,903	4,508,774
4,455,258	4,485,407	4,496,908	4,508,831
4,455,725	4,485,678	4,497,338	4,508,924
4,456,493	4,485,802	4,497,419	4,509,416
4,458,711	4,485,835	4,497,657	4,509,490
4,458,769	4,485,917	4,497,821	4,509,676
4,459,460	4,485,945	4,497,901	4,509,679
4,459,708	4,486,118	4,497,964	4,509,861
4,459,937	4,486,149	4,498,336	4,510,030
4,463,269	4,486,324	4,498,664	4,510,163
4,463,315	4,486,359	4,499,187	4,511,375
4,463,821	4,486,646	4,499,527	4,511,744
4,465,750	4,486,979	4,499,601	4,511,876
4,469,602	4,487,154	4,499,666	4,520,156
4,470,667	4,487,785	4,500,139	4,520,613
4,471,285	4,488,286	4,500,260	
4,471,751	4,489,478	4,500,365	

Disclaimers

4,185,319.—*Roger G. Stewart,* Neshanic Station, N.J. NON-VOLATILE MEMORY DEVICE. Patent dated Jan. 22, 1980. Disclaimer filed Apr. 22, 1985, by the assignee, *RCA Corp.*

Hereby enters this disclaimer to claims 1 and 6 of said patent.

4,354,833.—*Kinya Fujita,* Yokosuka, Japan. ORTHODONTIC APPLIANCE. Patent dated Oct. 19, 1982. Disclaimer filed June 3, 1985, by the inventor.

Hereby enters this disclaimer to claims 1, 2, 3 and 5 of said patent.

4,362,182.—*John R. Sjolund,* Arden Hills, Minn. NOZZLE FORCE FEEDBACK FOR PILOT STAGE FLAPPER. Patent dated Dec. 7, 1982. Disclaimer filed Dec. 20, 1984, by the assignee, *Sundstrand Corp.*

Hereby enters this disclaimer to all claims of said patent.

4,468,672.—*Corrado Dragone,* Little Silver, N.J. WIDE BANDWIDTH HYBRID MODE FEEDS. Patent dated Aug. 28, 1984. Disclaimer filed Oct. 22, 1985, by the assignee, *Bell Telephone Laboratories, Inc.*

Hereby enters this disclaimer to claims 1, 4 and 7 of said patent.

4,497,682.—*Paul H. Hamisch, Jr.,* Franklin, Ohio. HAND-HELD ELECTRICALLY SELECTABLE LABELER. Patent dated Feb. 5, 1985. Disclaimer filed May 31, 1985, by the assignee, *Monarch Marking Systems, Inc.*

Hereby enters this disclaimer to claim 25 of said patent.

Dedications

4,428,459.—*Paul L. Peck,* Fond du Lac, Wis. TREE STAND. Patent dated Jan. 31, 1984. Dedication filed Mar. 11, 1985, by the assignee, *Tru Fire Corp.*

Hereby dedicates to the public the entire term of said patent.

4,489,304.—*Charles L. Hayes,* Vista, Calif. SPRING DISCONNECT MECHANISM FOR SELF CENTERING MULTIPLE AXIS ANALOG CONTROL STICK. Patent dated Dec. 18, 1984. Dedication filed May 31, 1985, by the inventor.

Hereby dedicates to the public the entire term of said patent.

Disclaimers and Dedications

Des. 238,435.—*Roman F. Garbark,* Westchester, Ill. ROLL-OVER GUIDE FOR PIN BALL MACHINE. Patent dated Jan. 13, 1976. Disclaimer and dedication filed Mar. 4, 1985, by the assignee, *Mylstar Electronics, Inc.*

Hereby disclaims and dedicates to the public the entire term of said patent.

4,502,463.—*Willis H. Gregory,* Angier, N.C. METHOD AND APPARATUS FOR EFFICIENTLY CAPTURING AND DISTRIBUTING HEAT PRODUCED BY GAS LOGS. Patent dated Mar. 5, 1985. Disclaimer and dedication filed Apr. 22, 1985, by the inventor.

Hereby disclaims and dedicates to the public the entire term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

The.e patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manu . of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF June 8, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	3-28-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-24-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	4-11-83
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	1-04-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	7-16-82
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	10-11-83
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	4-30-82
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	2-28-83
DESIGN, GROUP 290—K. L. CAGE, Director	1-03-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	7-08-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-10-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-14-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	7-22-83

Expiration of patents: The patents within the range of numbers indicated below expire during June 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,386,103 to 3,390,404, inclusive

Plant Patents ..... Numbers 2,814 to 2,816 inclusive

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,952

METHOD AND APPARATUS FOR THE LEAK TESTING OF FILTERS

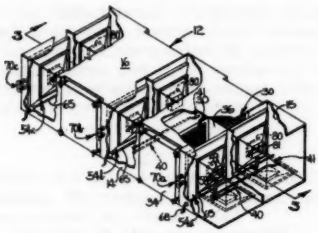
David E. Wilcox, Atlantic Beach, and Thomas T. Allan, Washington, both of N.C., assignors to Flanders Filters, Inc., Washington, N.C.

Original No. 4,324,568, dated Apr. 13, 1982, Ser. No. 177,234, Aug. 11, 1980. Continuation of Ser. No. 017,289, Mar. 5, 1979, abandoned. Application for reissue Apr. 11, 1984, Ser. No. 598,984

Int. Cl.[3] G01M *3/20*; B01D *46/12, 46/42*

U.S. Cl. 73—40.7

18 Claims



13. An apparatus for filtering an airstream and having provision for testing for leakage of particles of predetermined size through or around each of at least two filters mounted in series, and characterized by minimum space requirements, and comprising

a housing defining an air passageway adapted to form a part of an air duct system having an airstream passing therethrough,

means sealably mounting first and second filters within the housing in a spaced apart, serial arrangement and such that the airstream passing through the housing passes serially through the first and then the second filter,

means for selectively introducing particles of predetermined size into said housing at a first location which is upstream of said first filter,

turbulence imparting means mounted downstream of said first filter and upstream of said second filter for selectively imparting turbulence throughout substantially the entire cross section of said airstream,

means for selectively introducing particles of predetermined size into said housing at a second location which is downstream of said first filter and upstream of said second filter and such that the introduced particles are subjected to the turbulence imparted by said turbulence imparting means,

first particle detection means mounted upstream of the second filter and downstream of said turbulence imparting means for detecting at least a portion of any of said particles in the airstream to thereby permit a determination as to whether any of said particles which are introduced at said first location are leaking through or around the first filter, and

second particle detection means mounted downstream of the second filter for detecting at least a portion of any of said particles in the airstream to thereby permit a determination as to whether any of said particles which are introduced at said second location are leaking through or around the second filter,

whereby said turbulence imparting means is adapted to provide the separate functions of mixing the airstream and any leaking particles during testing of the first filter, and mixing the airstream and the particles introduced at said second location during testing of the second filter.

Re. 31,953

METHOD OF CHARGING A BOREHOLE

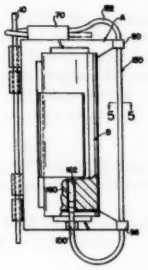
Brooke J. Calder, Jr., Aurora, OH; David L. Childs, Madisonville, Ky.; Roger N. Prescott, Lyndhurst, Ohio, and Donald W. Lyons, Madisonville, Ky., assignors to Austin Powder Company, Beachwood, Ohio

Original No. 4,133,247, dated Jan. 9, 1979, Ser. No. 866,277, Jan. 3, 1978. Division of Ser. No. 740,799, Nov. 11, 1976,. Application for reissue Dec. 31, 1980, Ser. No. 221,920

Int. Cl. F42D *1/08*

U.S. Cl. 86—20 C

5 Claims



4. A method of charging a borehole with at least first and second separated sections of explosive material, said method comprising the steps of:

(a) providing a detonating cord extending into said borehole;

(b) providing a first primer on a first carrier having an elongated first time delay element with an input end and extending between said detonating cord and said first primer, said time delay element having a first selected time delay value;

(c) providing a second primer on a second carrier having an elongated second time delay element with an input end and extending between said detonating cord and said second primer, said second time delay element having a second selected time delay value different from said first time delay value;

(d) maintaining said input end of said first time delay element is slidable contact with said detonating cord;

(e) maintaining said input end of said second time delay element in slidable contact with said detonating cord;

(f) loading said first section of explosive material into said borehole;

(g) sliding said first carrier and primer along said detonating cord and into a position in said borehold where said first primer is in detonation relationship with said first section of explosive material;

(h) loading a separating non-explosive decking material over said first section explosive material;

(i) loading said second section of explosive material into said borehole; and

(j) sliding said second carrier and primer along said detonating cord and into a position in said borehole where said second primer is in detonation relationship with said second section of explosive material.

Re. 31,954

ORAL COMPOSITION

Ralph Fine, East Brunswick, N.J., and Sidney Weiss, Levittown, Pa., assignors to Colgate-Palmolive Company, New York, N.Y.

Original No. 4,374,822, dated Feb. 22, 1983, Ser. No. 327,668, Dec. 7, 1981. Continuation-in-part of Ser. No. 312,211, Oct. 19, 1981,. Application for reissue Mar. 26, 1984, Ser. No. 593,070

Int. Cl. A61K *7/16, 7/26*

U.S. Cl. 424—49 **25 Claims**

1. A flavored oral hygiene composition comprising a dental mouthwash, dental cream or dental gel vehicle consisting essentially of a humectant, *a sialagogue, in amount up to about 5% by weight of said dentifrice, consisting essentially of* a flavoring oil in amount to provide flavor characteristic to said composition up to about 5% by weight of said composition and *a sweetening agent free from ammoniated glycyrrhizin characterized by early appearance of sweetness and early extinction of sweetness* and about 0.002–0.007% by weight of a 5'-ribonucleotide.

PLANT PATENTS

GRANTED JULY 23, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,518
MINIATURE ROSE PLANT

Cecelia L. D. Bennett, 489 Minot Ave., Chula Vista, Calif. 92010

Filed Dec. 19, 1983, Ser. No. 563,277
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—7 1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, much branched habit, substantially as illustrated and described, characterized by its petals of pale pink with slightly darker pink at the margins and vigorous growth habit, easy to propagate from cuttings, with flowers borne singly and in sprays of 3 to 5 or more.

5,519
HYBRID TEA ROSE PLANT VC. MACAUCK

Samuel McGredy, IV, Auckland, New Zealand, assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Nov. 30, 1983, Ser. No. 556,544
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—20 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, being particularly characterized by the brilliant, lasting red coloration of its flowers, essentially as described and illustrated; its heavy petal substance that lends to longer-than-average flower longevity both in the garden and in the vase; its consistent vigor and bloom performance under a wide range of climatic conditions; its above-average disease resistance; and its abundant and nearly continual production of long-stemmed flowers.

5,520
MAGNOLIA GRANDIFLORA NAMED BRACKENS BROWN BEAUTY

Ray Bracken, Piedmont, S.C., assignor to Ray Bracken Nursery, Inc., Piedmont, S.C.

Filed Dec. 23, 1983, Ser. No. 564,886
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—51 1 Claim

1. The new and distinct variety of magnolia grandiflora, substantially as herein shown and described, characterized by its vigorous, dense, pyramidal growth habit and its abundant production of small, white, very fragrant flowers and rose red fruits which are half the size of those normal to the species.

5,521
CHRYSANTHEMUM PLANT NAMED ILLINI HARVEST

John R. Culbert, Clinton, Ill., assignor to University of Illinois, Chicago, Ill.

Filed Apr. 25, 1983, Ser. No. 488,071
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct cultivar of chrysanthemum named Illini Harvest, as illustrated and described, and particularly characterized by its flat capitulum form and single anemone capitulum type; red bronze ray florets and yellow-green to golden yellow cushion of disc florets; 55–65 mm. diameter across face of capitulum; excellent flower production, and by its medium pot plant height and semi-upright branching pattern.

PATENTS

GRANTED JUL. 23, 1985

ERRATA

For CLASS	See PATENT NO.
623–001	4,530,113
623–023	4,530,114
623–023	4,530,115
623–023	4,530,116
623–006	4,530,117
073–304	4,530,222
171–016	4,530,403
164–467	4,530,404
428–291	4,530,652
494–045	4,530,691
514–016	4,530,836
514–018	4,530,837
514–011	4,530,838
514–171	4,530,839
514–179	4,530,840
514–210	4,530,841
514–344	4,530,842
514–416	4,530,843
514–458	4,530,844
514–453	4,530,845
423–584	4,530,850
525–403	4,530,994
346–135	4,531,183

PATENTS

GRANTED JULY 23, 1985

REISSUE

PATENTS

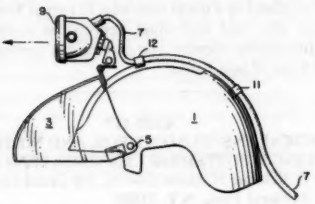
GRANTED JULY 23, 1985

GENERAL AND MECHANICAL

4,530,111
BODY ARMOR
Edward R. Barron, Boston, and Abraham L. Lastnik, Framingham, both of Mass., assignors to Multi-Tech Corporation, Natick, Mass.
Filed Aug. 26, 1983, Ser. No. 527,167
Int. Cl.³ F41H *1/02*
U.S. Cl. 2—2.5 **20 Claims**

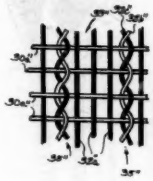
1. An armored garment including means for verifying ballistic interception capabilities of the garment comprising:
a garment body of ballistic intercepting material having a peripheral edge;
a tab of said ballistic intercepting material appendant to, integral with, and continuously formed as an extension of the material of said body;
means formed with the garment and intermediate the tab and the body for allowing severing of the tab from the body;
said garment ballistic interception capabilities being verifiable by subjecting the tab to ballistic impact.

4,530,112
SELF-ADJUSTING CAP LAMP BRACKET
Andrew B. Cecala, Baldwin, and Jon C. Volkwein, Canonsburg, both of Pa., assignors to The United States of America as represented by the Secretary of Interior, Washington, D.C.
Filed Apr. 25, 1983, Ser. No. 488,480
Int. Cl.³ A42B *1/24*
U.S. Cl. 2—209.2 **4 Claims**



1. A combined lamp and headpiece with a face shield attached thereto comprising:
a headpiece to be worn on the head of a user with a light beam emitting source connected thereto, said source being connected to the headpiece by a power transmitting conduit fixed to the headpiece and means for supplying a retaining force to the source;
a protective face shield mounted to said headpiece and movable with respect to it along a direction having a first horizontal component and a vertical component from a first face protecting position to a second upper face exposed position; and
pivot means interconnecting the light emitting source to the face shield for causing the automatic movement of said source in a direction having a second horizontal component and a vertical component, said first horizontal component being opposite in direction to said second horizontal component when the shield is moved from its first to its second position whereby the orientation of the direction of the light beam emitting source remains substantially the same as it was before the shield was moved.

4,530,113
VASCULAR GRAFTS WITH CROSS-WEAVE PATTERNS
Samuel A. Matterson, Coalville, England, assignor to Intervascular, Inc., Freeport, Tex.
Filed May 20, 1983, Ser. No. 496,454
Int. Cl.³ A61F *1/00*; D03D *3/02*
U.S. Cl. 623—1 **20 Claims**



1. A vascular graft prosthesis comprising a tube formed of fabric insertable into the vascular system for the conveyance of blood therethrough, the fabric being a weave having a plurality of warp threads running the longitudinal direction and weft thread means running the circumferential direction, at least a portion of said warp threads at substantially regular intervals comprising pairs of warp threads that cross over each other with said weft thread means running between cross-over points of said crossed warp thread pairs, said weft thread means being restrained at each passage between said cross-over points against axial displacement, preventing unravelling of said weft thread means at ends of said prosthesis, the fabric being woven of a low porosity to promote retention of blood within said fabric prosthesis.

14. A fabric adapted for use in a prosthesis for implanation into a living body, the fabric being a weave having a plurality of warp threads in one direction and weft thread means running in a generally perpendicular direction, pairs of warp threads that cross over each other with said weft threads means running between cross-over points of said crossed warp thread pairs and between about one and about twenty straight parallel warp threads interspersed between adjacent pairs of crossed warp threads with said weft thread means forming a normal weave pattern with said parallel warp threads, said weft thread means being restrained at each passage between said cross-over points from displacement in the running direction of said warp threads, preventing unravelling of said weft thread means at the ends of said warp threads.

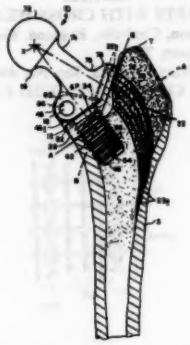
4,530,114
TOTAL HIP JOINT PROSTHESES
Slobodan Tepic, 6 Sermageova, 41000 Zagreb, Yugoslavia
Filed Jul. 16, 1982, Ser. No. 398,842
Int. Cl.³ A61F *1/04, 5/04*
U.S. Cl. 623—23 **39 Claims**

1. Prosthesis apparatus comprising
A. a base plate for engaging flush against a prepared part of a bone;
B. at least one elongated flexible substantially inextensible tension transmitting means having one end extending to said plate and its opposite end arranged to be anchored inside said bone at a first location therein normally subjected to tension forces;

C. a joint member positioned against said base plate;

D. connecting means for connecting a first part of said joint member to said one end of said tension transmitting means;

E. compression transmitting means for transmitting compressive loads on said first member to bone, said compressive transmitting means including a first portion for anchoring inside said bone adjacent said plate at a second location therein different from said first location and normally subjected to compression forces and a second portion extending to said joint member through said plate;



F. coupling means for coupling a second part of the joint member to said second compression transmitting means portion so that a normal load applied to the joint member is reduced to a compression force on the compression transmitting means; and

G. decoupling means for decoupling the plate from the compression forces applied to the compression transmitting means.

4,530,115

SHANK FOR A PROSTHESIS

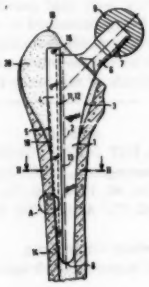
Maurice E. Müller, Bern; Peter G. Niederer, Zollikofen, and Otto Frey, Winterthur, all of Switzerland, assignors to Gebrüder Selzer AG, Winterthur and Protek AG, Bern, both of, Switzerland

Filed Jan. 3, 1983, Ser. No. 454,991

Claims priority, application Switzerland, Jan. 29, 1982, 541/82

Int. Cl.³ A61F *1/04, 5/04*

U.S. Cl. 623—23 **17 Claims**



1. A shank for a prosthesis comprising

a blade having a conically widening shape extending from a distal end to a proximal end along a longitudinal median axis, said blade including a neck at said proximal end and a guide extending along one lateral narrow side thereof; and

a lateral end piece having a wedge shape in the longitudinal direction slidably received in said guide and extending over the entire length of the shank.

4,530,116

ANCHORING SHANK FOR A BONE IMPLANT

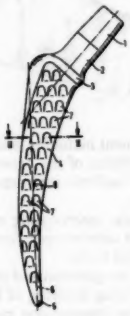
Otto Frey, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Oct. 6, 1983, Ser. No. 539,564

Claims priority, application Switzerland, Oct. 15, 1982, 6018/82

Int. Cl.³ A61F *1/04, 5/04*

U.S. Cl. 623—23 **11 Claims**



1. An anchoring shank for a bone implant having a tapered configuration narrowing along a longitudinal axis from a proximal end to a free distal end, at least one surface of said shank having a plurality of transverse parallel rows of individual discrete arch-like depressions therein, each of said depressions extending essentially in the direction of said longitudinal axis, each of said depressions having flanks tapering conically from said distal end and converging to an apex towards said proximal end whereby said depressions form a trough parallel to said longitudinal axis gradually merging into said shank surface from a proximal to a distal direction to permit bone cement to penetrate into said individual depressions during insertion within the cement thereby compacting the cement due to the conical form of said flanks.

4,530,117

SURGICAL INSTRUMENT FOR AND METHOD OF INSERTING A POSTERIOR CHAMBER LENS IN AN EYE

Charles D. Kelman, N. Shore Towers, 269 Grand Central Pkwy., Bldg. 3, Floral Park, N.Y. 11005

Filed Jan. 30, 1984, Ser. No. 574,920

Int. Cl.³ A61F *1/16, 1/24, 9/00*

U.S. Cl. 623—6 **12 Claims**

1. A surgical instrument for seating an intraocular lens in the posterior chamber of an eye, comprising:

a longitudinally extending shank portion;

a hook portion at one end of said longitudinally extending shank portion having a neck portion and a tip portion, said tip portion extending transversely to the plane containing said shank portion and said neck portion.

11. A method of seating an intraocular lens in the posterior chamber of an eye comprising:

inserting an intraocular lens into the eye and seating the lower haptic of the lens in the posterior chamber;

inserting a portion of an instrument having a longitudinally extending shank through an opening in the eye, said instrument having at one end of said longitudinally extend-

ing shank a hook portion having a neck and a tip at the end of said neck transverse to said neck;

moving the tip into engagement with the upper haptic of the lens still in the anterior chamber; and

moving the instrument substantially axially thereof to compress said haptics until the upper haptic fits through the pupil of the eye;

moving the instrument to move the upper haptic through the pupil into the posterior chamber;

moving the instrument in reverse substantially axial direction allowing the haptics to expand toward their undeformed condition, so as to at least substantially seat the upper haptic in the posterior chamber while embracing the iris in the neck of the instrument;

rotating the instrument about its axis to withdraw the tip from the upper haptic; and

moving the instrument in said first mentioned axial direction until the tip is in registry with the pupil so that it may be withdrawn through the pupil from the posterior chamber.

4,530,118

PASSIVE DISPENSER

Randall G. Richards, Cincinnati, Ohio, assignor to The Drackett Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 346,975, Feb. 8, 1982, Pat. No. 4,419,771. This application Oct. 6, 1983, Ser. No. 539,512

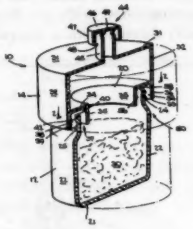
Int. Cl.³ E03D *9/02*

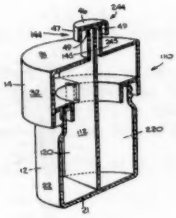
U.S. Cl. 4—228 **14 Claims**

1. A nonsiphoning passive dispenser for containing a quantity of solution substantially isolated from a body of liquid and for causing a predetermined volume of said solution to issue from the dispenser solely under conditions of gravity flow in response to the level of said body of liquid being lowered from a first elevation to a second elevation, said dispenser adapted for placement at the bottom of said body of liquid, the dispenser comprising:

an upper section which is a cuplike member having an open bottom, the lower peripheral edge being an annular channel;

a lower section which is a cuplike member having an open top, the top peripheral edge of the lower section being disposed within said annular channel to define a discharge/refill conduit and said cuplike members providing an internal reservoir for storage of cleaning solution formed upon dissolution of a water-soluble cake contained with said reservoir, the discharge/refill conduit connecting said reservoir with the body of liquid and comprising two chambers in fluid communication with each other, one chamber being adjacent to said reservoir to form an air trap chamber and the other being adjacent to said body of liquid to form an air refill chamber, a transfer port connecting said air trap and air refill chambers, the cross-sectional area of said transfer port normal to fluid flow being smaller than the cross-sectional area of said air trap chamber normal to fluid flow such that air in said conduit is not completely displaced by said liquid when the level of the body of liquid rises from said second elevation to the first elevation, the air being entrapped in said air trap chamber and forming, upon cessation of flow into the reservoir, an air lock in said conduit that substantially isolates said solution from the body of liquid, and





vent means above the discharge/refill conduit for air to vent from said reservoir.

4,530,119

FLUSHING CONTROLLER FOR TOILET

Huan-Juei Chiu, and Ming-Sheng Chiu, both of P.O. Box 10160, both of Taipei, Taiwan

Filed Aug. 1, 1983, Ser. No. 518,828

Int. Cl.³ E03D *1/14, 3/12*

U.S. Cl. 4—324 **2 Claims**

1. An improved flushing controller for a toilet comprising:

a variable flushing actuator extending inwards a spindle which is connected with a lever to pull toilet flush valve by a wire;

a pre-set flushing actuator having spindle formed with a central hole to freely insert said spindle of said variable flushing actuator;

a fixed bushing forming with a hollow cylinder for rotatably fixing said two spindles of said variable flushing actuator and said pre-set flushing actuator on a toilet tank wall; and

a vertically adjusted float formed under said fixed bushing, the improvement which comprises:

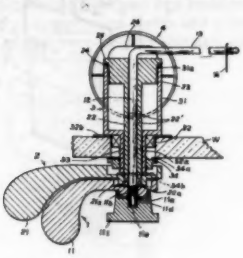
said pre-set flushing actuator formed with a float engaging means which is formed with three upper extensions and a lower extension, respectively extending from said spindle of said pre-set flushing actuator and separated in equal radians, said lower extension cut with a recess to engage with a float lever;

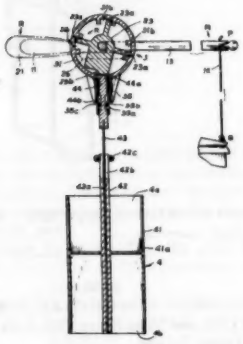
said pre-set flushing actuator formed with an extension ring formed at the rear end of said float engaging means and rotatably fixed in said fixed bushing, a bushing cover rotatably sealing said hollow cylinder of said bushing, and a rest plate extending from said bushing cover to biase said lever for valve opening;

said fixed bushing formed with a hollow cylinder wherein three grooves are formed inside said hollow cylinder to limit the rotation of said three upper extensions of said float engaging means, and formed with a guide block under said engaging means, a hollow pipe for reciproca-

tive motion of a float lever provided in said guide block; and

said vertically adjusted float comprising a hollow cylinder which is partitioned traversely by a diaphragm plate to form an upper chamber filled with water and a lower chamber accumulated with air therein and centrally longitudinally formed with a central tube for free adjustment of said float lever jacketed in said central tube, and a float lever having a lever head which is formed with a tapered portion on its top end to engage with said recess of said float engaging means, whereby said preset flushing actuator is depressed to engage said recess of said lower extension with said float lever as backed by float buoyancy and said lever is biased by the rear rest plate to open a toilet flush valve for flushing use.





4,530,120

METHODS AND APPARATUS FOR BATHING

Kenji Etani, P.O. Box 206, West Townsend, Mass. 01474

Division of Ser. No. 40,302, May 18, 1979, abandoned, and a continuation-in-part of Ser. No. 934,425, Aug. 17, 1978, abandoned, which is a continuation of Ser. No. 717,514, Aug. 25, 1976, abandoned, which is a continuation-in-part of Ser. No. 591,536, Jun. 30, 1975, abandoned. This application Mar. 31, 1980, Ser. No. 136,033

Int. Cl.³ A47K *3/00*

U.S. Cl. 4—538 **12 Claims**

1. The method of feeding water treatment chemicals into a bathing system including

(a) a tank,

(b) a pump,

(c) an intermediate-velocity chamber,

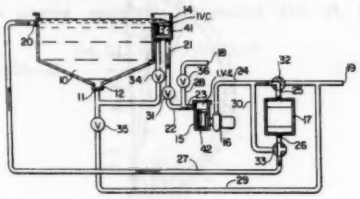
(d) piping to interconnect said pump, tank, and chamber in a recirculating system, and

(e) a quantity of water within said tank, pump, chamber, and piping, which method comprises the steps of:

(1st) placing a feeder within said intermediate-velocity chamber of said system, and

(2nd) subjecting said feeder to flow of said water at intermediate velocity thereby to extract a dose of chemical contained in said feeder at a controlled rate, wherein

(i) said feeder is a compact container of volume between 0.1 and less than 24 cubic inches, resistant to attack by water and said chemical, perforated by a number of small holes each less than three square millimeters in cross section and greater than five thousandths of an inch (0.005") in diameter, and with an aggregate area of said holes less that



0.02% of the surface area of said feeder, and is close enough to spherical in shape and close enough to neutral in buoyancy dependant on said water velocity, that said flow causes said feeder to move about freely and roll,

(ii) said chamber is of sufficient size to contain said feeder without substantial restriction of flow and to let said feeder move to stir its contents, and

(iii) said dose comprises a chemical from the group consisting of flocculants, coagulants, microbiocides, chelating agents, defoamers, germicides, evaporation retarders, and dyes.

4,530,121

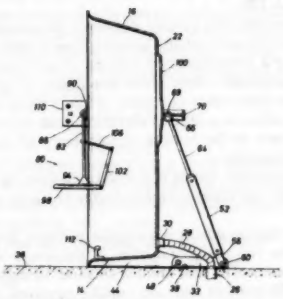
TILTING BATH WITH PIVOTAL USER SEAT

Edison P. Penney, 3750 Underwood, Houston, Tex. 77025

Filed Jun. 1, 1984, Ser. No. 616,133

Int. Cl.³ A47K *3/062*

U.S. Cl. 4—540 **7 Claims**



1. A movable bathtub mechanism for use by persons with infirmities, comprising:

(a) support means adapted to be secured to the floor of a building structure;

(b) a bathtub being pivotally interconnected at one end thereof with said support means;

(c) a seat structure being pivotally secured to said bathtub said seat structure being presentable in an initial preset sealing position and remaining at said preset position during pivotal movement of siad bathtub;

(d) hydraulically energized linear motor means being interconnected to said support means and said bathtub and

being selectively operable to move said bathtub between a horizontal position wherein said bathtub is usable and an upstanding position where said seat structure is positioned to receive a person desiring its use; and

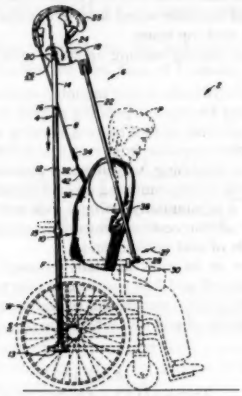
(e) a flexible drain tube interconnecting the drain opening of said bathtub with the plumbing drain of the building structure.

4,530,122

PATIENT WEIGHT RELIEVER APPARATUS

Robert C. Sanders, and Donald M. Sanders, both of Sacramento, Calif., assignors to Sanders EZ Mobility Systems, Sacramento, Calif.

Filed Jun. 7, 1982, Ser. No. 385,971
Int. Cl.³ A61G 7/10
U.S. Cl. 5—83 **13 Claims**



1. Patient weight reliever apparatus for at least partially lifting a patient from a support structure, such as a bed or a wheelchair, comprising:

a support frame including first and second spaced apart upright supports, an overhead support member connecting the upper ends of said upright supports and means for supporting said upright supports in a generally vertical attitude;

vertical lift means mounted to said overhead support member including an eccentric roller pivotally mounted to said overhead support member at a pivot point and a lift line connected to the roller at one end, said roller adapted to wind a portion of said lift line onto and off of a cam surface thereof when said eccentric roller pivots about said pivot point;

a patient sling adapted to support the patient when lifted by said lift means;

means for selectively coupling said lift line and said sling; and

handle means for actuating said lift means to raise said sling and patient a desired distance to relieve pressure on the patient's contact points.

4,530,123

REST BED, MORE SPECIALLY FOR YOUNG CHILDREN

Marcel Mathou, 12630 - Gages, France

Filed May 3, 1982, Ser. No. 374,023
Claims priority, application France, May 6, 1981, 81 09040
Int. Cl.³ A47C 19/16
U.S. Cl. 5—110 **4 Claims**

1. A rest bed comprising a mattress support, a mattress overlaying said mattress support, at least two lugs extending upwardly on opposite sides of said mattress support and at least one strap secured to said mattress support proximate said lugs, said strap being stretched over said mattress and above said lugs whereby said mattress is firmly pressed on said upwardly extending lugs, said mattress support being provided with at

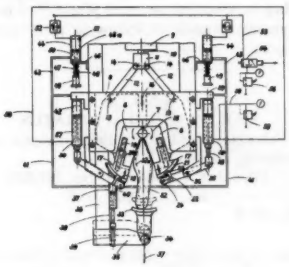
least two openings adjacent to said lugs, said strap further extending below said mattress support through said openings and being provided, at both ends thereof, with hooking rings which are engageable around said lugs.

4,530,124

DEVICE FOR TOE AND BALL LASTING OF A SHOE UNIT

Gerald Sommer, Lemberg, Fed. Rep. of Germany, assignor to International Shoe Machine Corporation, Nashua, N.H.

Filed Sep. 22, 1983, Ser. No. 534,537
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1982, 3245120
Int. Cl.³ A43D 21/16, 21/00
U.S. Cl. 12—12.4 **9 Claims**

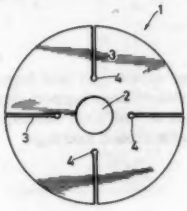


1. A device for toe and ball lasting a shoe unit consisting of a last with a shoe upper superimposed thereon and an insole arranged on the last bottom, comprising a shoe support acting against the shoe bottom to support the shoe unit, a heel clamp provided with adjusting means for movement towards and away from said shoe support, and main wipers seated above the shoe support for linear movement and pivotal movement about a fulcrum point and carrying, on their side opposite the fulcrum point, ball wipers arranged for longitudinal displacement, said main wipers being provided with corresponding drive means for moving them, in a combined longitudinal and pivotal inward movement, below the contour of a shoe unit placed on the shoe support, wiping simultaneously the lasting margin of the upper against the insole, during which combined movement the ball wipers can be moved by corresponding adjusting means, from an initial rearward position towards the fulcrum point, characterized in that the said device comprises a sensing element for scanning the length of the shoe unit placed upon the shoe support, and for emitting a signal indicative of the length of the said shoe unit, said sensing element coacting with adjusting means which are controlled by said signal and which serve to automatically adjust the initial position of the ball wipers on the main wipers to the respective length of the shoe unit.

4,530,125
SWIMMING POOL CLEANER COMPONENT

Helmut J. Hofmann, Pompano Beach, Fla., assignor to Selero Limited, Braamfontein, South Africa

Filed May 1, 1984, Ser. No. 605,953
Int. Cl.³ E04H 3/20
U.S. Cl. 15—1.7 4 Claims

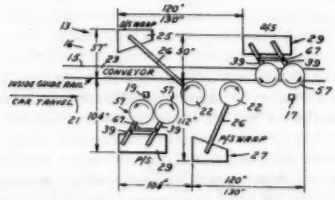


1. In a swimming pool cleaner of the vacuum suction type having a body and a suction inlet, pressure pad means for enabling the cleaner to traverse relatively small radius transitions between horizontal and vertical surfaces without significant loss of vacuum, said pressure pad means comprising a circular disc (1) of flexible plastics sheet material, a central opening (2) defined in said disc for engaging around the suction inlet of the cleaner body, and a plurality of equally circumferentially spaced radial slots (3) having parallel sides and extending from an outer peripheral edge of the disc across a major portion of the radius thereof toward the central opening, said slots dividing the disc into an equal plurality of independently flexible segments capable of following pool wall transitions and curvatures.

4,530,126
CAR WASHING APPARATUS

James A. Belanger, Northville, Mich., assignor to Belanger, Inc., Northville, Mich.

Filed Jan. 4, 1984, Ser. No. 567,990
Int. Cl.³ B60S 3/06
U.S. Cl. 15—97 B 16 Claims



1. In a car washing apparatus for successively scrubbing the front, sides and rear of a vehicle body during movement of the vehicle along a predetermined path in a bay having a floor wherein a pair of spaced longitudinally staggered wrap around scrubbing wheels are mounted upon opposite sides of said path outwardly of said body, the improvement comprising;

a pair of spaced free standing longitudinally staggered side wheel assemblies for scrubbing, washing and polishing the sides, rocker panels and wheels, mounted upon opposite sides of said path and in longitudinal spaced relation with said wrap around scrubbing wheels respectively, operatively engaging along opposite sides of said body;

each side wheel assembly including an elongated base plate mounted upon the floor;

an upright side frame mounted upon said base plate including a top beam;

a first horizontal side wheel arm at one end pivotally mounted upon said top beam and extending forwardly at an acute angle toward said path;

a first bearing housing upon the other end of said arm;

a first hydraulic motor mounted upon said bearing housing having a depending first drive shaft journaled through said bearing housing;

a first scrubbing, washing and polishing wheel of fabric material axially mounted on said shaft for rotation upon a substantially vertical axis and adapted to operatively and successively engage the sides, rocker panels and wheels of said vehicle upon its opposite sides as a vehicle moves through said bay;

actuating means interposed between said side frame and said first horizontal side wheel arm and the connected first scrubbing wheel for moving said wheel arm and first wheel relative to said path and to said vehicle body;

a second horizontal side wheel arm spaced from and parallel to said first side wheel arm, at one end pivotally mounted upon said top beam;

a second bearing housing upon the other end of said second arm;

a second hydraulic motor mounted upon said second bearing housing having a depending second drive shaft journaled through said second bearing housing and rotatable in the direction opposite from said first drive shaft;

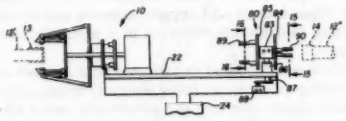
a second scrubbing, washing and polishing wheel of fabric material axially mounted on said second shaft for rotation upon a substantially vertical axis and adapted to operatively and successively engage the sides, rocker panels and wheels of said vehicle; and

a tie bar at its ends pivotally connected to intermediate portions of said first and second side wheel arms for controlling pivotal movements of said second wheel arm upon movement of said first wheel arm by said actuating means.

4,530,127
THREAD CLEANING DEVICE

Royce G. Roberts, P.O. Box 1296, Kenai, Ak. 99611

Continuation of Ser. No. 197,895, Oct. 17, 1980, abandoned.
This application Sep. 3, 1982, Ser. No. 414,989
Int. Cl.³ B08B 9/02
U.S. Cl. 15—104.04 6 Claims



1. A tool for cleaning threads located on the opposed marginal ends of a pipe, comprising: a main framework (22), a horizontal shaft (91, 98) having opposed ends, a first and second opposed plate member (84, 85) having the central axis thereof attached to said horizontal shaft ends, means (83) for imparting rotational motion into said shaft so that each said plate member rotates about the central axis thereof;

a vertical shaft (87), a support means (86) attached to said main framework for supporting said vertical shaft for rotation about the longitudinal axis thereof; journal means (83) by which a medial length of said horizontal shaft is rotatably supported from one end of said vertical shaft; whereby, said horizontal shaft ends can be rotated about said support means to describe a plane within which the horizontal shaft lies;

a plurality of cleaning brushes (89, 90), means (95) mounting said brushes on said first and second plate members, said brushes on each plate member are radially positioned respective to one another and to the horizontal shaft, means (92) for adjustably positioning said brushes of each plate respective to one another; the brushes (89) located on a face of one plate member are positioned in opposition

to the brushes (90) located on the face of the other plate member; means (88) for rotating said vertical shaft about the longitudinal axis thereof, thereby reversing the relationship of the brushes in a horizontal plane; whereby:

the brushes located on one plate member can engage and clean external pipe threads, while the brushes on the other plate member can engage and clean internal pipe threads; and,

the relative position of the plate members can be reversed by moving the brushes 180° within said plane.

4,530,128

MOTOR DRIVEN CYLINDRICAL BRUSH FOR A CLEANING APPARATUS

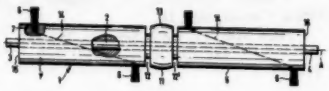
Gernot Jacob, Weissach-Flacht, and Robert Maier, Nufringen, both of Fed. Rep. of Germany, assignors to Progress-Elektrogeräte Mauz & Pfeiffer GmbH & Co., Stuttgart, Fed. Rep. of Germany

Filed Dec. 21, 1983, Ser. No. 564,084

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1982, 3247298

Int. Cl.³ A46B 7/10

U.S. Cl. 15—182 **6 Claims**



1. A motor driven cylindrical brush for a cleaning apparatus which includes a brush housing; said brush comprising:

a cylindrical brush member mounted in said brush housing, said brush member being provided with a centrally outwardly curved contact surface for a drive belt which is operatively associated with a motor;

length compensation means provided with said brush member and including at least one length compensating zone therewith, which extends at right angles to the longitudinal axis of said brush member;

a bristle filling inserted in said brush member and projecting radially beyond said brush member; and

a bearing spindle connected to said brush member and having opposite ends which project axially beyond said brush member for effecting mounting thereof in said brush housing, said length compensation means avoiding any unsteady running of said brush member as well as subsequent dynamic balancing of said brush member otherwise needed to compensate for any buckling occurring as a consequence of material compression when said bristle filling is inserted in said brush member, and caused by length changes due thereto said at least one length compensating zone being at least one annular recess in said brush member; each of said recesses being connected directly to said contact surface; said bristle filling comprising tufts of bristles, and said brush member including holes for receiving said tufts of bristles; each of said recesses, in the radial direction of said brush member, having a depth which is at least approximately equal to the depth of said holes.

4,530,129

DISPOSABLE TOOTHBRUSH

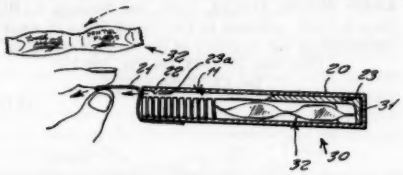
Richard A. Labick, c/o George Spector, 3615 Woolworth Bldg, 233 Broadway, and George Spector, c/o Richard A. Labick, 3615 Woolworth Bldg., 233 Broadway, both of, New York, N.Y. 10007

Filed Sep. 22, 1982, Ser. No. 421,469

Int. Cl.³ A46B 9/04

U.S. Cl. 15—184 **1 Claim**

1. A disposable toothbrush with front and rear ends and storage tube with an end wall comprising in combination a toothbrush with a handle slideably engaging said tube, a toothpaste container and dental floss stored alongside said toothbrush in said tube, means for slideably extending said handle longitudinally outward of said tube in combination with a spur and coacting spaced notches on said toothbrush and tube for retaining said handle in stored and extended positions whereby said tube provides a handle extension for said toothbrush:



further including a transverse tab on said toothbrush behind said container parallel and adjacent to said end wall, said tab being integral with said rear end of said toothbrush adapted to eject said container when the toothbrush is extended, in further combination with a front end closure which adhesively engages the toothbrush and partially extracts the toothbrush upon being opened.

4,530,130

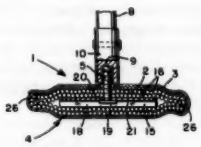
MOP SWAB WITH SCREW-ON MOP HEAD

Theron C. Moss, Cleveland, Tenn., assignor to Seco Industries, Inc., Cleveland, Tenn.

Filed May 27, 1983, Ser. No. 498,985

Int. Cl.³ A47L 13/24

U.S. Cl. 15—229 A **6 Claims**

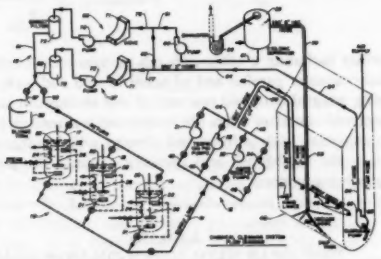


1. A mop swab comprising a plurality of mop cords, a fabric headband securing said mop cords together intermediate the ends of said mop cords, an elongated support strip extending transversely of said mop cords beneath said headband, said mop cords overlying the opposite sides and ends of said support strip, and a threaded stud extending through a central opening in said support strip, said threaded stud having a head portion at one end engaging one side of said support strip, the mop cords overlying said one side of said support strip also overlying said head portion, and the other end of said threaded stud extending outwardly between the mop cords overlying the other side of said support strip and through the headband, the ends of said support strip extending in opposite directions beyond said threaded stud for a substantial portion of the width of said headband to provide support for said headband, and securing means for securing said support strip between said mop cords beneath said headband, said support strip being generally channel-shape in cross section including a base member having said central opening therein through which said threaded stud extends outwardly between said mop cords overlying said other side of said support strip and through said headband, and a pair of side members, said head portion of said threaded stud having a non-circular shape which is received between said pair of side members, the spacing between said side members being slightly greater than the spacing between the opposite sides of said non-circular head portion to prevent turning of said threaded stud during screwing of a handle thereon and unscrewing such handle.

4,530,131
AUTOMATIC VACUUM RECYCLABLE SYSTEM FOR CHEMICAL-THERMO CLEANING OF SHIP TANKS AND BILGES

Warren E. Zell, Fountain Valley; Charles E. Imel, Ojai, both of Calif.; Richard D. Saam, Corpus Christi, Tex.; Peter J. Hearst, Oxnard, Calif.; Nicholas J. Olah, Oxnard, Calif.; Adolph Bialecki, Oxnard, Calif., and Rececca L. Biggers, Oxnard, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 28, 1983, Ser. No. 546,253
Int. Cl.³ B08B 3/02
U.S. Cl. 15—321 **18 Claims**



1. A recyclable system for chemical cleaning and preparing enclosed surfaces of large tanks, comprising:

a. a supply storage means for preparing, holding and recirculating chemical cleaning solutions;

b. nozzle means strategically arranged within a tank being cleaned for spraying liquid chemical cleaning solutions onto all surfaces to be cleaned;

c. supply pump means for selectively delivering chemical cleaning solutions from said supply storage means at both high pressure—low volume and high volume—low pressure to said nozzle means for stripping and cleaning the surfaces to be cleaned;

d. a high-volume high-velocity vacuum means operable to air lift up to 75 gpm through a vertical lift of up to 100 feet communicating with the interior of the tank being cleaned for withdrawing a mixture of the sprayed liquid chemical cleaning solutions, air and vapor mists, along with sludge and solid wastes removed from the tank interior surfaces; said high-volume high-velocity vacuum means for air lifting liquid chemical cleaning solutions, vapor mists, sludge and solid wastes including a larger diameter air vacuum hose together with a smaller diameter air driven eductor hose section attached at the entrance of said larger diameter hose; said air driven eductor hose operating to withdraw liquid, sludge and solid wastes from the bottom of the tank being cleaned, to where it is mixed with air and vapor mists withdrawn through said larger diameter hose; said high-volume high-velocity vacuum means also operating to control vapor mists and provide ventilation in the area being cleaned;

e. said high-volume high-velocity vacuum means including separation means for separating the chemical cleaning solutions, vapor mist, sludge and solid wastes withdrawn from the tank being cleaned and delivered to said separation means, and exhausting the air from said mixture; said separation means including a cyclonic separation tank having a surge tank capacity for partial heavy solid settling prior to transfer of the returned mixture to said filtration means; said separation tank being provided with means for directly removing partially settled solids and sludge therefrom; said high-volume high-velocity vacuum means also including an air exhauster system operable to move air at a rate up to 3000 cfm through said larger diameter air vacuum hose and which air drives said eductor hose and operates to air lift the mixture of chemical solutions, sludge and solids withdrawn from the tank being cleaned to said separation means where the air is exhausted and the remaining mixture following partial heavy solid settling and removal is transferred to a filtration means;

f. said filtration means being connected to said ation means and being operable to separate remaining solids and sludge from the returning chemical solutions in the fluid mixture withdrawn from the tank being cleaned; said filtration means including hydro-sieve means operable to remove large solids from the returning fluid mixture, and a fine filter means to remove additional fine solids and sludge;

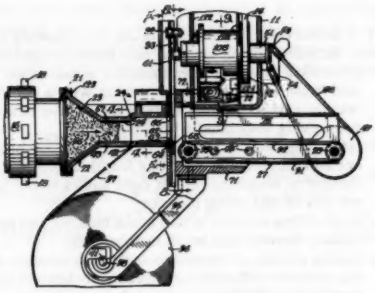
g. said vacuum means also including a separate and independent pump means operable to provide additional and alternate transfer of liquid suspension mixtures from said tank being cleaned directly to said filtration means;

h. means for delivering cleaned chemical cleaning solutions from said filtration means to said supply storage means for refreshing and recirculation of the solutions through the system for further cleaning use.

4,530,132
MEAT LOAF FORMING APPARATUS

Richard C. Wagner, Frankfort, Ill., assignor to Hollymatic Corporation, Countryside, Ill.

Filed Mar. 11, 1982, Ser. No. 357,134
Int. Cl.³ A22C 7/00
U.S. Cl. 17—45 **8 Claims**



8. The method of forming a moldable food product of the nature of ground raw meat into a series of loaves of predetermined shape and weight, comprising:

pressure extruding said food product through a die of selected cross-sectional shape to provide a moving elongated block of said product, said die defining a tapered formed section opening at its narrow end to a forming section having an inlet portion defining a corrugated top wall and a planar bottom wall, and an outlet portion having a grooved bottom wall and a top wall spaced from said grooved bottom wall a distance greater than the spacing of the corrugated top wall from the planar bottom wall of the inlet portion, permitting the corrugated top surface of the block to expand freely toward said outlet portion top wall;

conveying said block away from said die during said extruding on a generally horizontal conveyor moving at a speed faster than said block to provide sliding contact therebetween;

severing said block into a series of separate loaves;

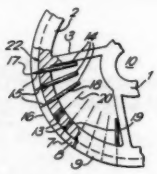
moving each separate loaf on said conveyor at a linear speed faster than the linear speed of said moving block to provide a spacing between a separate loaf and said block; and

sensing the leading edge of said block in said spacing between said block and said separate loaf for initiating said severing operation.

4,530,133
OPENING ROLLER FOR OPEN END SPINNING MACHINES

William R. Stewart, Craigmount; David B. Stewart, Newtyle, and John M. C. Dickinson, Largoward, By Elie, all of Scotland, assignors to Wm. R. Stewart & Sons (Hacklemakers) Ltd., Dundee, Scotland

Filed Feb. 7, 1984, Ser. No. 577,877
Claims priority, application United Kingdom, Feb. 25, 1983, 8305376
Int. Cl.³ D01G 9/14
U.S. Cl. 19—97 20 Claims

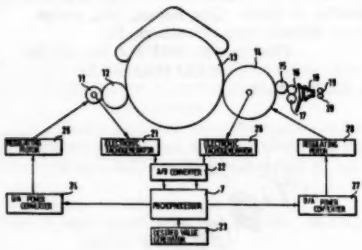


1. An opening roller for open end spinning machines comprising a one-piece extrusion including a central body; an outer ring having a generally cylindrical external surface; and a plurality of septal walls connecting said ring to said central body; said external surface including combing elements penetrating said external surface and extending outwardly from said external surface.

4,530,134
COMPUTERIZED CONTROL SYSTEM FOR A CARDING MACHINE

Fritz Hösel, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. Kg, Monchen-Gladbach, Fed. Rep. of Germany

Filed May 20, 1982, Ser. No. 380,293
Claims priority, application Fed. Rep. of Germany, May 20, 1981, 3120134
Int. Cl.³ G05B 15/00, 11/00; D01G 15/02
U.S. Cl. 19—105 28 Claims



1. An electronic control system for a machine which forms fiber material into a length of sliver which is delivered into a storage can, and which includes a carding cylinder, a feed roller for supplying fiber material to the cylinder, a doffer for removing a web of carded fibers from the cylinder and means for removing the carded fibers from the doffer and forming them into the length of sliver, each of the carding cylinder, feed roller and doffer being driven at a respective operating speed, said system comprising: monitoring means for monitoring the operation of said machine; controllable regulator means connected for controlling the operating speed of at least one of said doffer and feed roller; and microcomputer means connected to said monitoring means and said regulator means for controlling said regulator means, said microcomputer means comprising:

data memory means operable for receiving data signals constituting representations of predetermined values for the operating speed of at least one of said doffer and feed roller and properties of the fiber material to be processed, for storing such representations, and for transmitting data signals constituting such representations;

program memory means for storing a representation of the sequence of operations to be performed by said microcomputer means, said program memory means being operable for receiving signals for controlling readout from said program memory means and for transmitting program signals based on the stored representation of the sequence of operations;

microprocessor means constituting a central processing unit and connected for controlling the transmission of such signals to and from said data memory means and said program memory means;

interface logic means connected to said microprocessor means for supplying to said microprocessor means data signals intended for said data memory means and for receiving from said microprocessor means data signals transmitted by said data memory means and program signals transmitted by said program memory means, and connected to said monitoring means for receiving information therefrom;

input means connected to said interface means for the input of data and program information to be stored in said data memory means and said program memory means; and

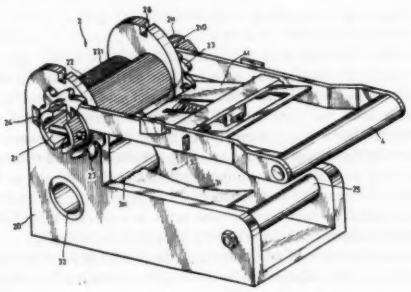
output logic means connected between said interface logic means and said regulator means for supplying signals for controlling said regulator means;

whereby said microcomputer means control the operation of said machine on the basis of the representations stored in said data and program memory means and the information provided by said monitoring means.

4,530,135
ROLLER WHEEL BALER

Kuo M. Hsiang, No. 9, Alley 22, Lane 22, Sheh Tzu St., Szu Lin Area, Taipei, Taiwan

Filed Aug. 2, 1983, Ser. No. 520,005
Int. Cl.³ A44B 21/00; B25B 25/00
U.S. Cl. 24—68 CD 5 Claims



1. A baler for use in tightening and tensioning a strap, said baler comprising:

(a) a body;

(b) a roller wheel compressor unit including a transmission roller wheel and a free roller wheel, said wheels each including means for gripping the strap, the ends of said free roller being disposed in a slot in said body to permit relative movement of said free roller wheel toward and

away from said transmission roller, the strap, in use, being passed between said roller wheels; and

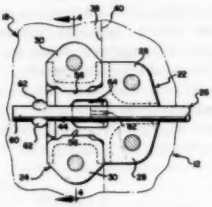
(c) a braking unit including a braking board, a fixed support member and spring means, the fixed support member being attached to said body, said braking board having a toothed end confronting said fixed support, the strap, in use, being passed between said toothed end and said fixed support, said toothed end being urged by said spring means toward said fixed support member and into engagement with said strap when passed therebetween.

4,530,136

BAYONET-TYPE LATCH MECHANISM WITH POSITIVE LOCKING FUNCTION

Douglas R. Konkle, Pinnacle, N.C., assignor to Sunline Hardware, Inc., King, N.C.

Filed Sep. 24, 1982, Ser. No. 422,738
Int. Cl.[3] A44B *21/00*
U.S. Cl. 24—608 5 Claims



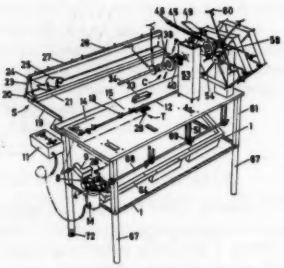
1. A selectively lockable latch to be used in fastening two furniture parts or the like in temporary alignment, comprising: bolt means having a projecting nose and a channel bisecting said nose to define a slideway for a lock rod and to divide said nose into a pair of laterally flexible arms; strike box means comprising confronting surface means for releasibly latchably receiving said bolt nose therebetween; snap-latch means including first and second interengagable cam means disposed respectively on said bolt nose and said surface means for latchably acting between said bolt means and said strike box means; and a lock rod longitudinally slidably received in said nose channel, including end means for being disposed between said laterally flexible nose arms in a first longitudinal and rotational position to prevent convergence of said arms whereby to lock said bolt means to said strike box means and to be withdrawn from between said flexible nose arms in a second longitudinal and rotational position whereby to permit convergence of said arms and release of said bolt means from said strike box means, said lock rod including radial protuberance means for acting as a position stop when said lock rod is in said first longitudinal and rotational position and said channel being dimensioned to permit rotation of said lock rod into said second rotational position and withdrawal from said channel into said second longitudinal position, said bolt means further including elongate cavity means providing working space for said protuberance means, said cavity means being dimensioned to admit said end means in said second longitudinal position freeing said nose arms for convergence and for resultant withdrawal of said bolt means from latching engagement with said strike box means.

4,530,137

APPARATUS FOR UNRAVELING KNITTED FABRIC

Trevor A. Moss, and Roger E. Moss, both of 71 Abbey La., Leicester LE4 5QU, England

Continuation of Ser. No. 354,087, filed as PCT GB 81/00084, May 11, 1981, published as WO 81/03670, Dec. 24, 1981, § 102(e) date Jan. 27, 1982, abandoned. This application Jun. 29, 1984, Ser. No. 606,987
Claims priority, application United Kingdom, Jun. 17, 1980, 8019770
Int. Cl.[3] D04B *19/00*
U.S. Cl. 28—171 6 Claims



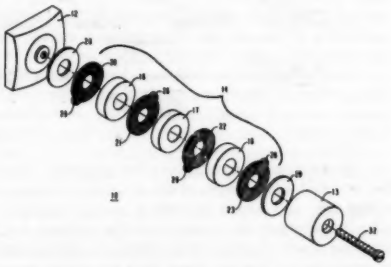
1. A machine for unraveling knitted fabric which comprises means for securing a piece of knitted fabric, a guide for directing an end of yarn from the fabric, a flexible former for receiving the yarn from the guide, a spindle rotatably mounting the former, an adjustable slip clutch between the former and the spindle, a drive to the former through the slip clutch, a variable speed motor for rotating the former through the drive, means for adjusting the clutch to allow the speed of rotation of the former to adapt to the resistance of the yarn to unraveling, the drive from the motor to the former comprising a substantially horizontal shaft driven by the motor and means supporting the shaft for vertical movement, the shaft being vertically suspended by a belt which transmits the drive to the slip clutch.

4,530,138

METHOD OF MAKING A TRANSDUCER ASSEMBLY

Catharine A. Ritter, Glen Burnie, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 30, 1982, Ser. No. 429,594
Int. Cl.[3] H01L *41/22*
U.S. Cl. 29—25.35 10 Claims



1. A method of assembling a transducer having a plurality of components including a stack of piezoelectric rings, a head and tail mass and a plurality of electrodes having irregular surfaces, comprising the steps of:

(A) assembling all of said components such that said electrodes are respectively positioned on both ends of said stack as well as interposed between piezoelectric rings, with said stack being interposed between, and coupled to,

said head and tall masses, the irregular surfaces of said electrodes defining passageways between adjacent components;

(B) reducing the pressure within said passageways to less than normal atmospheric pressure;

(C) bringing said pressure back to normal atmospheric pressure while at least said stack is immersed in a flowable adhesive, the adhesive thereby flowing into said passageways;

(D) said adhesive also providing a coating surrounding said stack;

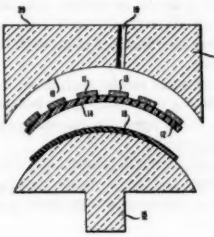
(E) curing said adhesive to bond the stack components together and provide an anti-arcing coating surrounding said stack.

4,530,139

METHOD OF CONTOURING CRYSTAL PLATES

Anton J. Miller, Allentown, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 23, 1983, Ser. No. 535,029
Int. Cl.³ H04R *17/00*
U.S. Cl. 29—25.35 **7 Claims**



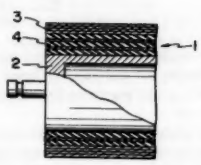
1. A method of fabricating piezoelectric devices which include crystal plates comprising the steps of attaching a plurality of crystal plates to a compliant sheet, molding the sheet to the curved shape of an applicator surface, securing the sheet to said applicator surface which includes a resilient pad formed thereon and abrading the plates against another curved surface by means of the applicator to remove at least a portion of one of the surfaces of each plate.

4,530,140

OFFSET PREVENTIVE DIFFUSING ROLLERS FOR FIXING ROLLERS FOR ELECTRONIC COPYING MACHINES

Shigeo Okamura, Osaka; Yoshihiro Sato, Shinbashi, and Kenji Takahashi, Mishima, all of Japan, assignors to Minolta Camera K.K.; Nitto Kogyo K.K. and Hodaka Kogyo K.K., all of, Japan

Filed Sep. 14, 1982, Ser. No. 417,929
Claims priority, application Japan, Sep. 14, 1981, 56-145138
Int. Cl.³ B21B *27/02*
U.S. Cl. 29—110 **11 Claims**



1. In an offset preventive diffusing roller subsidiary to a fixing roller for electronic copying machines having a cylindrical oil absorbing layer fixed around a cylindrical solid core which is to be supported at both ends thereof, an improvement which comprises;

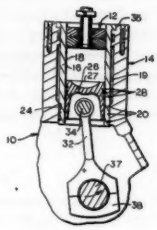
said oil absorbing layer comprises oil diffusing layers and oil retaining layers, each of said oil diffusing layers having fibrous bodies extending in the axial direction of said core, and each of said oil retaining layers being composed of a homogeneous soft and porous material containing therein numerous fine spaces communicating with one another and to the outer face of said layer and scattered throughout said material.

4,530,141

UNITARY REMOVAL OF ENGINE CYLINDER LINER, PISTON AND ROD

Louis F. Vachon, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 490,942, May 2, 1983, abandoned. This application Nov. 7, 1983, Ser. No. 549,130
Int. Cl.³ B23P *15/00*
U.S. Cl. 29—156.4 WL **11 Claims**



1. A method from removing a cylinder liner and a piston, ring and rod associated with said liner as a unit from an engine block, comprising:

inserting a pulling tool in the bore of said liner above said piston;

expanding said tool against said liner and establishing frictional contact between said tool and said liner;

applying a force on said tool and moving said tool with said liner relative to said bore of said engine block;

establishing at least a partial vacuum in said liner below said tool and above said piston; and

removing as the unit said liner together with said piston, ring and rod from said engine block by continuing said force, after disconnecting said rod from a crankshaft located within said engine block.

4,530,142

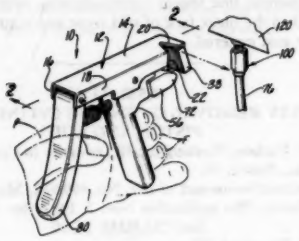
TUBING DISCONNECT TOOL

John H. Schiffer, 25541 King Rd., Romulus, Mich. 48174

Filed Oct. 19, 1983, Ser. No. 543,410
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—237 **9 Claims**

1. A hand tool for disconnecting a tubular member from associated connector fitting by imparting relative separation forces on said tubing and fitting in a direction generally axially of the tubing, comprising a frame member having means adapted to engage the fitting to exert a separating force thereon, a bell crank pivotally connected to said frame member and having means movably mounted thereon and operable for engaging and releasing said tubing in the vicinity of said fitting, and a lever pivotally connected to said frame and movable relative to said bell crank for sequentially imparting tube gripping engagement of the tubing by said bell crank and pivoting motion to said bell crank to thereby draw the tubing away from the fitting and to thus disconnect the tubing from the fitting, said tube gripping means comprising a plunger sub-

assembly slidably mounted in said bell crank and having a squeeze block mounted on one end thereof and movable relative to a juxtaposed tube-engaging portion of said bell crank, said plunger sub-assembly also having a follower means mounted thereon remote from said squeeze block and operably abuttingly engageable with said lever such that movement of



said lever relative to said bell crank through a first stage of motion abuttingly pushes said follower means to thereby advance said sqeeze block into engagement with the tubing and squeezes the tubing between the squeeze block and said juxtaposed tubing engaging means of said bell crank and imparts in a sequential second stage of motion via a camming lever action the pivotal tube stripping motion to said bell crank.

4,530,143

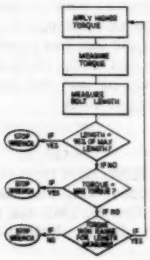
ULTRASONIC BOLT TENSIONER

Dominick A. Casarcia, 10289 Crestland Ct., Cincinnati, Ohio 45239

Filed May 4, 1983, Ser. No. 491,465

Int. Cl.³ B23Q *17/00*

U.S. Cl. 29—407 **7 Claims**



4. A method of tightening a bolt, comprising the following steps:

(a) associating with each of several bolt lengths a range of bolt torques;

(b) applying to the bolt a torque which monotonically increases with time;

(c) periodically measuring both the applied torque and the bolt change in length;

(d) ascertaining whether the measured change in length of (c) falls within the range of (a) for that torque; and

(e) if the measured change in length does not fall within the range, terminating the application of torque.

4,530,144

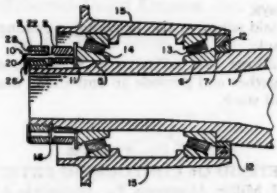
METHOD FOR ADJUSTING AND RETAINING BEARINGS ON AN AXLE

George A. Hagelthorn, P.O. Box 5197, Dearborn, Mich. 48128

Filed Jun. 9, 1983, Ser. No. 502,588

Int. Cl.³ B23Q *17/00*

U.S. Cl. 29—407 **6 Claims**



1. In a method for establishing the exact and final predetermined clearance required in a bearing and axle assembly to assure acceptable performance of roller bearings and conventional and axle components which are retained and maintained in a secured position on an axle spindle, the steps comprising:

placing an inner means such as an axle nut on the axle to establish the reference point with respect to the bearing on the axle,

placing an outer means such as an axle nut on the axle and establishing the proper space between said inner and outer means based upon the distance required according to the final clearance,

and thereafter while maintaining the relationship between said inner and outer means moving said inner and outer means a distance corresponding to the predetermined clearance.

4,530,145

METHOD OF FORMING A PIPE CONNECTION

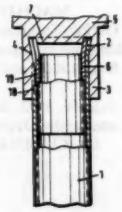
Hans Bergheim, and Winfried Griep, both of Bonn, Fed. Rep. of Germany, assignors to Vaw Leichtmetall GmbH, Dellweg, Fed. Rep. of Germany

Division of Ser. No. 195,495, Oct. 9, 1980, Pat. No. 4,388,013. This application Apr. 13, 1983, Ser. No. 484,635

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1979, 2945474

Int. Cl.³ B23P *25/00*

U.S. Cl. 29—458 **4 Claims**



1. A method of joining a pipe to a pipe connector, said pipe connector having an outwardly flared opening for receiving said pipe and a centering piece for receiving a sleeve, comprising the steps of:

inserting a sleeve having a flared end into said pipe connector so that the interior wall of said sleeve engages said centering piece to form a flared channel between the exterior surface of said sleeve and the interior surface of said channel, said sleeve fitting securely on said centering piece so that said sleeve and connector and held together without the use of any supplemental fastening means

while defining a channel of fixed dimensions into which an end of the pipe is to be inserted; and

forcing an end of said pipe into said flared channel.

4,530,146

PROCESS AND APPARATUS FOR ASSEMBLING THE STRIPS OF A GRILLE

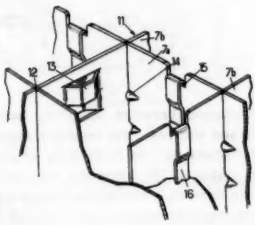
Bernard Véré , Eybens; Maura Biryoukoff, Limonest, and Paul Mathevon, Bollene, all of France, assignors to Cogema and Framatome, Villacoublay, France

Filed Sep. 16, 1983, Ser. No. 532,930

Claims priority, application France, Sep. 16, 1982, 82 15662

Int. Cl.³ B23Q *3/00;* **B23P** *17/00, 15/12*

U.S. Cl. 29—468 **8 Claims**



1. Process for assembling grilles formed from two sets of similar strips, the strips of one of said sets being disposed orthogonally to the strips of the other set and comprising slots which co-act with complementary slots in said other set to effect a lap-jointing assembly, said process comprising the steps of

(a) arranging said first set of strips in an assembly jig equipped with parallel slots for receiving the terminal sections of the strips of said first set;

(b) inserting the strips of said second set one by one;

(c) said assembly jig being displaced on fixed guide means to bring it into a position in which all the strips of said first set have their first slot disposed facing an insertion path for a strip from said second set via a movable insertion device for said strips, said path being orthogonal to the displacement direction of said assembly jig and being defined by said fixed guide means;

(d) placing an appropriate strip from said second set on said movable device located in a retracted position;

(e) advancing said movable device to cause it to penetrate between the strips of said first set and to engage the strip of said second set;

(f) releasing the strip of said second set from said device;

(g) withdrawing said device; and

(h) recommencing the sequence for each strip of said second set.

4,530,147

METHOD OF GRAFTING A METAL REINFORCING MEMBER IN A STRUCTURE OF COMPOSITE FIBRE-RESIN MATERIAL

Jean P. Mattei, La Varenne Saint Hilaire, and Pierre F. Coutin, Paris, both of France, assignors to R. Alkan & Cie, France

Filed Sep. 2, 1983, Ser. No. 528,909

Claims priority, application France, Sep. 9, 1982, 82 15276

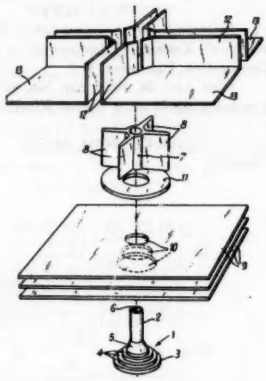
Int. Cl.³ B23P *19/02;* **B23B** *31/00*

U.S. Cl. 29—525 **3 Claims**

1. Method of grafting a metal reinforcement in a node of a structure made of composite materials such as fibres and resin for improving therein the bond between a flange and walls connected to this flange, which comprises:

(a) introducing a cylindrical end of a first element of a metal reinforcement member into openings provided in superposed layers of the flange, said cylindrical end being extended by an annular base portion provided with steps, said openings of the superposed layers being circular and having diameters which correspond with those of said steps of the base portion, so that said layers have a maximal contact area with the base portion of said first element,

(b) assembling the walls to radial fins of a second element of the metal reinforcement member rigid with a central tubular core,



(c) fitting on said cylindrical end of said first element to a third element of the metal reinforcement member shaped as a washer and urging under pressure said third element against said layers of the flange, and

(d) assembling the unit formed by said second element together with the walls to the unit formed by said first and third elements together with the layers, by fitting said central tubular core of the second element on the cylindrical end of the first element.

4,530,148

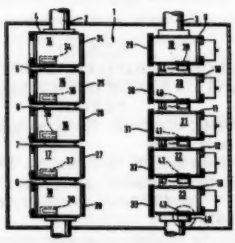
TOOL CHANGING MECHANISM

Walter Flamme, Wegberg-Beeckerheide, and Oskar Rahn, Kempen, both of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 297,567, Aug. 31, 1981, abandoned. This application Feb. 6, 1984, Ser. No. 576,797

Int. Cl.³ B23Q *3/157;* **B23D** *35/00*

U.S. Cl. 29—568 **21 Claims**



1. A tool changing mechanism for an automatic changing of male and female tools of a forming press having a gripper arm with two grippers arranged opposite to each other, which arm changes tools between corresponding positions in a magazine and the press, comprising a magazine having a plurality of tool holders arranged in pairs and straight rows in the same ar-

rangement as in the press, each of the male and female tools including different codings and each corresponding holder in the magazine having coding reading means which are connected to a comparator for comparing the codings read by the coding reading means with preset codings, the comparator being provided with an indicator for emitting an error signal if the read coding deviates from the preset coding.

4,530,149

METHOD FOR FABRICATING A SELF-ALIGNED VERTICAL IGFET

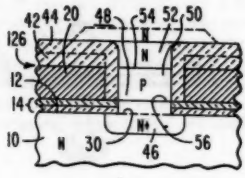
Lubomir L. Jastrzebski, Plainsboro; Alfred C. Ipri, Princeton, and Achilles G. Kokkas, Plainsboro, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 28, 1985, Ser. No. 489,307

Claims priority, application United Kingdom, Jun. 24, 1982, 8218286

Int. Cl.³ H01L *21/205*

U.S. Cl. 29—571 **17 Claims**



1. A method for fabricating a vertical IGFET device, comprising the steps of:

(a) providing a substrate having a monocrystalline silicon drain portion of first conductivity type at a surface thereof;

(b) forming a first insulating layer on said surface;

(c) forming a gate electrode of predetermined thickness on the first insulating layer, the electrode having an aperture therethrough, said aperture overlying a portion of said monocrystalline silicon portion;

(d) coating the apertured electrode with a second insulating layer so as to form an insulated gate;

(e) etching the first insulating layer, using the insulated gate as an etch mask, so as to expose an area of monocrystalline silicon within the aperture of the insulated gate;

(f) epitaxially growing silicon from said area of monocrystalline silicon so as to substantially fill the aperture; and

(g) doping said epitaxial silicon so as to form a body region of second conductivity type in opposition to said gate electrode, and a source region of first conductivity type overlying said second conductivity type portion.

4,530,150

METHOD OF FORMING CONDUCTIVE CHANNEL EXTENSIONS TO ACTIVE DEVICE REGIONS IN CMOS DEVICE

Takehide Shirato, Hiratsuka, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 20, 1983, Ser. No. 534,132

Claims priority, application Japan, Sep. 20, 1982, 57-163473

Int. Cl.³ H01L *29/02, 21/265*

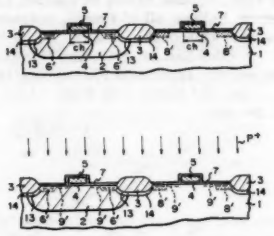
U.S. Cl. 29—576 B **11 Claims**

1. A method for producing a semiconductor device having a semiconductor substrate of a first conductivity type and having a well of a second conductivity type opposite the first conductivity type and selectively formed in the semiconductor substrate, comprising the steps of:

(a) forming, in the well, two first impurity regions having the first conductivity type;

(b) forming in an exposed surface region of the substrate, two second impurity regions having the second conductivity type; and

(c) forming, in the well and the exposed surface region of the substrate, a third impurity region by implanting impurity ions of one of the first or second conductivity type into the semiconductor substrate to selectively form an electric



current channel between one of the two second impurity regions and the two first impurity regions, so that integrated circuits can be formed by changing the electric current channel, the impurity ions of the third region being simutaneously introduced into a region between the two first impurity regions and a region between the two second impurity regions.

4,530,151

MANUFACTURE METHOD OF A SODIUM-SULFUR STORAGE BATTERY

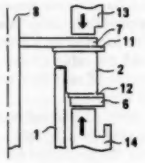
Hiroshi Kagawa, and Suminobu Iwabuchi, both of Takatsuki, Japan, assignors to Yuasa Battery Co., Ltd., Osaka, Japan

Filed Jul. 19, 1983, Ser. No. 515,147

Claims priority, application Japan, Jul. 19, 1982, 57-126477

Int. Cl.³ H01M *6/00*; B23K *31/02*

U.S. Cl. 29—623.1 **6 Claims**



1. A method for manufacturing a sodium-sulfur storage battery having an alpha-alumina ring jointed with solder glass to a sodium ion conductive solid electrolyte tube, a cathodic cover of sulfur-resistant metal and an anodic cover of molten sodium-resistant metal, the cathodic and anodic covers each having a thickness in the range from 0.2 mm to 0.6 mm and each being thermocompressively jointed to respective lower and upper surfaces of the alpha-alumina ring, the method further comprising the steps of:

disposing first and second plate-shaped aluminum rings between the lower and upper surfaces of the alpha-aluminum ring an the cathodic and anodic covers respectively; and

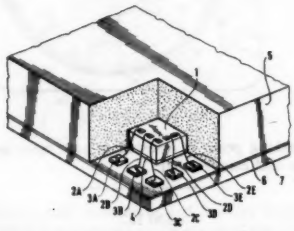
in air and at a temperature in the range from 600° C. to 625° C., thermocompressively jointing the cathodic and anodic covers to the alpha-aluminum ring with an applied jointing pressure in the range from 1200 to 1600 kg/cm^2.

4,530,152

METHOD FOR ENCAPSULATING SEMICONDUCTOR COMPONENTS USING TEMPORARY SUBSTRATES

Georges Roche, Chatillon Sous Bagneux, and Jacques Lantaires, Verrieres Le Buisson, both of France, assignors to Compagnie Industrielle des Telecommunications CIT-ALCATEL, Paris, France

Filed Apr. 1, 1983, Ser. No. 481,523
Claims priority, application France, Apr. 1, 1982, 82 05624
Int. Cl.³ H01L *21/92, 21/56, 21/58*
U.S. Cl. 29/588 8 Claims



1. A method of forming encapsulated semiconductor components comprising the steps of:

depositing a conductive layer of low melting point alloy on a metal temporary substrate,

depositing a metal array on said conductive layer of low melting point alloy to form connection areas to permit said components to be connected externally,

placing each component chip in position on said metal array,

electrically connecting each component chip to said connection area,

immobilizing the components by molding or pouring a hardenable resin over each component consisting of a chip, its electrical connections and its connection areas, and hardening said resin, and

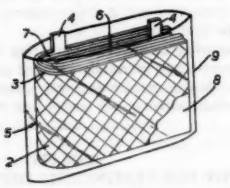
melting the alloy layer to permit removal of the temporary substrate and expose the surface of the connection areas for permitting external electrical and/or thermal connections to be made to said encapsulated components.

4,530,153

MANUFACTURING RECOMBINATION ELECTRIC STORAGE CELLS

Ernest J. Pearson, Swinton, England, assignor to Chloride Group Public Limited Company, London, England

Filed Oct. 31, 1983, Ser. No. 547,404
Claims priority, application United Kingdom, Oct. 29, 1982, 8230954
Int. Cl.³ H01M *10/12*
U.S. Cl. 29—623.1 11 Claims



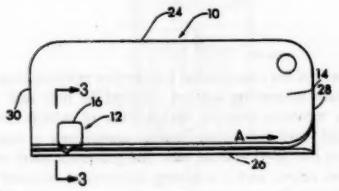
1. In a method of manufacturing an electric storage cell of the type containing positive and negative electrodes interleaved with separator material and substantially no mobile electrolyte, the improvement comprising pasting positive and negative electrodes with damp active electrode material, forming a cell pack of the electrodes having alternating positive and negative electrodes interleaved with separator material, inserting said cell pack into a plastic bag while the active electrode material is still damp, subsequently curing said electrodes so as substantially to dry them while the cell pack is within said bag, and thereafter inserting said cell pack into an outer container.

4,530,154

SLITTER ASSEMBLY

Carlton DiCarlo, Paramus, N.J., assignor to DiCarlo Pen Company, Paramus, N.J.

Continuation of Ser. No. 291,384, Aug. 10, 1981, abandoned, and a continuation-in-part of Ser. No. 47,741, Jun. 12, 1979, abandoned, and Ser. No. 239,459, Mar. 2, 1981, abandoned. This application Feb. 27, 1984, Ser. No. 583,885
Int. Cl.³ B26B *29/00*
U.S. Cl. 30—294 2 Claims



1. A slitting assembly for an envelope type assemblage, which comprises:

a body member having a bottom wall and an exterior side wall, said body member including an elongated slot extending inwardly from said exterior side wall, said elongated slot being formed of an elongated intermediate top wall and an elongated upwardly extending intermediate bottom wall that terminate in an elongated channel portion within said body member, said body member further including a notched portion positioned along said elongated slot and extending downwardly into said elongated upwardly extending intermediate bottom wall, said notched portion being comprised of a first wall segment and a second wall segment within said elongated upwardly extending intermediate bottom wall, said second wall segment being positioned after said cutting edge and intersecting said first wall segment, said first wall segment forming an angle α with a longitudinal axis of said elongated slot, and said second wall segment forming an angle β with said longitudinal axis, said angle α being greater than β to permit said edge portion of said envelope type assemblage to slide and dip during relative movement through said elongated slot;

a mounting member attached to said body member above said elongated slot; and

a cutting element including a cutting edge, said cutting element being affixed to said mounting member, said cutting edge extending at least partially across said elongated slot toward said notched portion, whereby upon longitudinal movement of an edge portion of said envelope type assemblage against said channel portion and through said elongated slot toward and into engagement with said cutting edge, said edge portion slides and dips into a separation between said cutting edge and said notched portion to effect slitting of only an upper sheet of said envelope type assemblage.

4,530,155

METHOD AND APPARATUS FOR REPRODUCING A REFERENCE POSITION IN AN INCREMENTAL MEASURING DEVICE

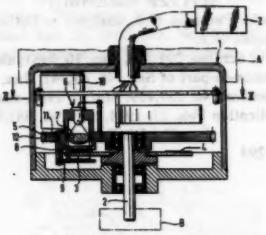
Horst Burkhardt, Truchtlaching; Alfons Ernst, and Holmer Dangschat, both of Traunreut, all of Fed. Rep. of Germany, assignors to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Mar. 20, 1984, Ser. No. 591,407

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1983, 3311203; Nov. 11, 1983, 3340866

Int. Cl.³ G01B *11/00*

U.S. Cl. 33—1 L 16 Claims



1. A method for determining a reference position in an incremental path measuring system coupled to first and second relatively movable objects, the position of which are to be determined, said measuring system comprising a measuring graduation provided with at least one reference mark coupled to the first object and a scanning component coupled to the second object for scanning the graduation and the reference mark, said method comprising the following steps:

(a) after a selected time, when the first and second objects, the measuring graduation and the scanning component are in respective momentary positions, decoupling one of the measuring graduation and the scanning component from the respective one of the first and second objects;

(b) shifting said one of the measuring graduation and the scanning component until one of the reference marks is scanned;

(c) returning the shifted one of the measuring graduation and the scanning component to the respective momentary position and then fixing the relative position of the shifted one of the measuring graduation and the scanning component with respect to the respective one of the relatively movable objects; and

(d) measuring the return path during step (c) between the scanning of the reference mark and the respective momentary position.

4,530,156

INFINITE RADIUS CIRCLE DRAWING INSTRUMENT

John S. Kettlestrings, 2235 Stonegate La., Wheaton, Ill. 60187

Filed Jul. 25, 1984, Ser. No. 634,150

Int. Cl.³ B43L *9/04;* B44D *3/30*

U.S. Cl. 33—27 R 15 Claims

1. A device for drawing circles comprising:

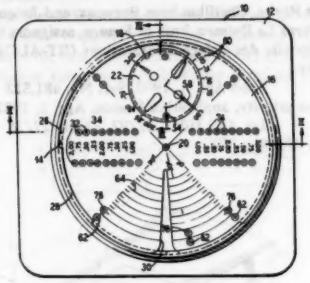
a sheet member for laying on a drawing surface;

a first member rotatably held within an opening in said sheet member, freely rotatable about a center point;

a second member rotatably held within an opening in said first member, offset from said center point;

at least one hole through said second member to accomodate a marking point; and

means for restraining said second member against rotation when



said marking point is inserted in said hole and rotated about said center point.

4,530,157

LENGTH MEASURING SYSTEM

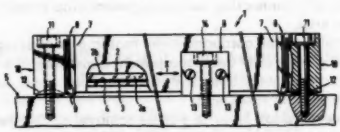
Guenther Nelle, Bergen, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Nov. 14, 1983, Ser. No. 551,277

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1982, 3243966

Int. Cl.³ G01B *11/04*

U.S. Cl. 33—125 R 13 Claims



1. In a measuring instrument for measuring the relative position of first and second objects, said instrument being of the type comprising a carrier which extends along a measuring direction and a scale which defines a graduation and is mounted to the carrier so as to be slightly movable in the measuring direction substantially independently of the carrier, said carrier defining first and second ends, the improvement comprising:

means for securing a central portion of the carrier directly to the first object; and

first and second means for mounting the first and second ends of the carrier, respectively, to the first object, each of said first and second mounting means comprising respective means for accommodating longitudinal movement of the respective end in the measuring direction with respect to the first object;

said securing means and mounting means cooperating to accommodate thermally induced movement of both ends of both the carrier and the scale along the measuring direction with respect to the first object.

4,530,158

GAUGE FOR TESTING THE DEPTH OF A HOLE

Jacques Chauquet, Bonneville, France, assignor to Etablissements J. M. Chauquet, Cluses, France

Filed Jun. 8, 1983, Ser. No. 502,094

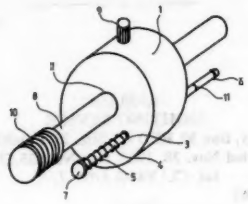
Claims priority, application France, Jun. 14, 1982, 82 10832

Int. Cl.³ G01B *5/18*

U.S. Cl. 33—169 B 16 Claims

1. A gauge for determining the depth of a hole, comprising

a main body, a probe carried by said main body intended to penetrate said hole, a mobile member slideably carried by said main body for longitudinal movement with respect to said main body, said mobile member having one end thereof adapted for abutment against an outer surface of a workpiece having a hole whose depth is to be determined, a stop member carried by said mobile member for limiting the forward movement thereof, indexing means carried by said main body member for indicating the relative position of said mobile member



with respect to said main body and thereby determining the depth of said hole when said probe member is at the end of the forward movement into said hole, adjustment means for adjusting the axial position of said probe with respect to said main body, locking means interacting between said probe and said main body for selectively angularly and axially fixing the position of said probe in said main body in a chosen position, and resilient means acting on said mobile member for urging said mobile member in a direction toward said workpiece having said hole to be tested.

4,530,159

MULTICOORDINATE SENSING HEAD

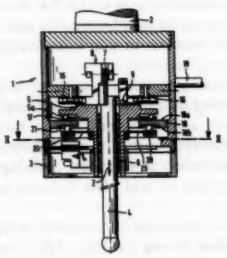
Alfons Ernst, Traunreut, Fed. Rep. of Germany, assignor to Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Sep. 12, 1983, Ser. No. 531,422

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1982, 3234471

Int. Cl.³ G01B *7/28*

U.S. Cl. 33—169 R **11 Claims**



1. In a multicoordinate sensing head comprising a sensing pin, a support member, and means for detecting deflection of the sensing pin, the improvement comprising:

means for defining a support surface fixedly secured with respect to the support member;

a guide member secured to the sensing pin;

means for guiding the guide member with respect to the support surface such that the guide member is movable with two degrees of translatory freedom over the support surface in a low friction, play-free manner;

means for preventing the sensing pin from rotating with respect to the support member; and

means for biasing the sensing pin into a predetermined rest position with respect to the support member, said biasing means comprising:

first and second concave annular races, one of which is coupled to the support member, the other of which is coupled to the guide member;

an array of balls captured between the two races; and

means for biasing the two races together to bias the sensing pin to the rest position.

4,530,160

SENSING PIN MOUNTING ARRANGEMENT FOR MULTICOORDINATE SENSING HEAD

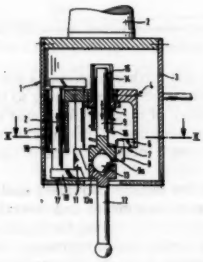
Kurt Feichtinger, Palling, Fed. Rep. of Germany, assignor to Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Sep. 12, 1983, Ser. No. 531,329

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1982, 3234470

Int. Cl.³ G01B *5/00*

U.S. Cl. 33—559 **9 Claims**



1. In a multicoordinate sensing head comprising a frame, a sensing pin and a position measuring system, the improvement comprising:

first and second guide levers;

means for mounting the sensing pin to the second guide lever;

first means for pivotably connecting the first guide lever to the second guide lever;

second means for pivotably connecting the first guide lever to the frame; and

third means, included in one of the first and second means, for permitting axially-guided movement of the sensing pin along a longitudinal axis of said sensing head by cooperation with said first and second guide levers to prevent tilting of the sensing pin with respect to said longitudinal axis;

said first and second guide levers guiding the sensing pin in a plane and enclosing an angle between said first and second guide levers;

a wedge drive mechanism interposed between the sensing pin and the position measuring system to transfer a deflection of the sensing pin to the position measuring system.

4,530,161

CALIPER TOOL USING MAGNETOSTRICTIVE DISPLACEMENT TRANSDUCER

Thomas J. Blankinship, Ft. Worth, Tex., assignor to Gearhart Industries Incorporated, Ft. Worth, Tex.

Filed Jun. 15, 1984, Ser. No. 621,057

Int. Cl.³ G01B *7/34*

U.S. Cl. 33—178 E **19 Claims**

1. A magnetostrictive displacement transducer system comprising:

a linear wire including a plurality of magnets located along

said wire, each magnet at least partially surrounding the circumference of said wire;

a pulse generator means attached to an end of said wire for transmitting the pulse into the wire in response to a control signal;

sensing means attached at the end of said wire for providing a sense output signal indicating a rotation of said wire at the attached end in response to said pulse interacting with the magnetic field of one of the plurality of magnets;

receiver means for receiving the pulse from said pulse generation means and further receiving a plurality of said sense output signals, each corresponding to the distance of one of said plurality of magnets from said end and providing therefrom a plurality of distance output signals, each signal indicating a location of one of the plurality of magnets; and

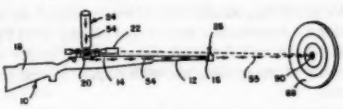
control means for initally providing said control signal to said pulse generation means and thereafter providing said control signal upon receiving the sense output signal from said sensing means which represents the distance of the furtherest magnet from the attached end.

4,530,162

APPARATUS AND METHOD FOR BORESIGHTING A FIREARM

Robert S. Forrest, 2101 San Lu Rae, SE., East Grand Rapids, Mich. 49506; Floyd Brouwer, Jenison, and Merlin J. Applegate, Grand Rapids, both of Mich., assignors to Robert S. Forrest, East Grand Rapids, Mich.

Filed Aug. 8, 1983, Ser. No. 521,044
Int. Cl.³ F41G *1/54*
U.S. Cl. 33—228 **13 Claims**



1. A firearm boresighting device for use on a firearm including a barrel having a chamber end and an opposite muzzle end, said boresighting device comprising:

a chamber end assembly to be operatively supported by the chamber end of the barrel, said chamber end assembly including light outlet means for emitting a collimated beam of light having a first diameter, said chamber end assembly further including means for generally concentrically positioning said light outlet means within the chamber end; and

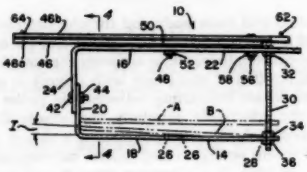
a muzzle end assembly to be operatively supported by the muzzle end of the barrel, said muzzle end assembly including aperture supporting means for supporting an aperture having a diameter smaller than said collimated beam diameter, said aperture being generally concentric with the muzzle end of the barrel, said muzzle end assembly further including beam position indicating means for indicating the position of said collimated beam with respect to said aperture, whereby said beam can be concentrically oriented with respect to said aperture, and further whereby the portion of said collimated beam passing through said aperture when said beam is concentrically oriented with said aperture comprises an imaginary coaxial extension of said bore usable for boresighting purposes.

4,530,163

SIGHTING DEVICE

Elmer L. Hovey, Box 30, RFD #1, Rte. 23, Franklin, N.J. 07416

Filed Nov. 28, 1983, Ser. No. 555,531
Int. Cl.³ F41G *1/00, 1/46*
U.S. Cl. 33—265 **10 Claims**



1. A sighting device, for a bow, comprising:

first means defining a base;

said base having means for coupling thereof replaceably to a bow;

second means defining a platform;

third means, joined to said base and platform, supporting said platform in spaced-apart adjacency to said base;

fourth means for removably receiving sighting means thereon; and

means pivotably coupling said fourth means to said platform, whereby elevation sighting adjustments may be made; and wherein

said third means comprises means for selectively disposing said platform (a) in parallelism with said base, and (b) in acute angles relative to said base, whereby azimuth adjustments may be made;

said first means comprises a first elongate plate;

said plate having a principal portion thereof subsisting in a given plane, and a minor portion thereof, at an end thereof, extending normal to said given plane;

said principal portion of said plate defining said base;

said minor portion of said plate defining part of said third means;

said second means comprises a second elongate plate;

said second plate having a principal portion thereof subsisting in a given plane, and a minor portion thereof, at an end thereof, extending normal to said latter given plane;

said principal portion of said second plate defines said platform;

said minor portion of said second plate defines part of said third means;

said minor portions of said first and second plates are in slidably, juxtapositioned and surmounting relationship;

one of said minor portions of said plates has an elongate slot formed therein;

the other of said minor portions of said plates has a plurality of apertures formed therethrough; and

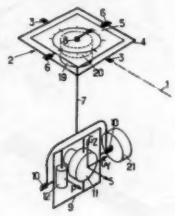
said apertures of said plurality thereof are aligned for registry with said slot.

4,530,164

GYROCOMPASS FOR SEA VEHICLES

Jacques Barriac, Plaisir, France, assignor to Societe d'Applications Generales d'Electricite et de Mecanique Sagem, Paris, France

PCT No. PCT/FR82/00093, § 371 Date Jan. 12, 1983, § 102(e) Date Jan. 12, 1983, PCT Pub. No. WO82/04313, PCT Pub. Date Dec. 9, 1982
PCT Filed Jun. 3, 1982, Ser. No. 459,531
Claims priority, application France, Jun. 4, 1981, 81 11100
Int. Cl.[3] G01K *17/384*
U.S. Cl. 33—324 8 Claims



1. Gyrocompass for a sea vehicle, comprising:

a pendular mechanism having a roll gimbal and a pitch gimbal;

a vertical fork suspended from said pendular mechanism;

an elevation gimbal carried by said fork having a horizontal axis of movement;

a gyroscope having two degrees of freedom which is carried by said elevation gimbal, said gyroscope also having a vertical axis of sensitivity, a vertical precession torquer motor for causing a vertical precession of said gyro about said vertical axis, a horizontal axis of sensitivity parallel to the axis of said elevation gimbal, a horizontal precession torquer motor for causing a horizontal precessing of said gyro about said horizontal axis, and a horizontal rotation axis; and

a detector of horizontality having an axis of sensitivity which is carried by said elevation gimbal such that the axis of sensitivity is parallel to the rotation axis of said gyroscope, said detector further including

(a) a position detector means of the vertical sensitivity axis of said gyroscope for controlling said vertical fork in azimuth,

(b) a position detector of the horizontal sensitivity axis of said gyroscope for controlling said elevation gimbal in elevation,

(c) a means for controlling said vertical precession torquer motor of said gyroscope such that the rotation axis of said gyroscope is horizontally leveled, said means causing said vertical precession torquer motor to produce a sinusoidal signal which is a function of the operation of said vertical precession torquer motor compensating for the rotation the Earth,

(d) a means for controlling said horizontal precession torquer motor of said gyroscope such that the rotation axis of said gyroscope moves in a horizontal plane at a uniform angular speed with respect to a fixed origin, and

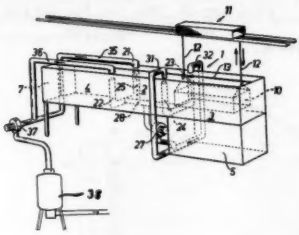
(e) a computer means which receives the sinusoidal signal from said vertical precession torquer motor for determining when the rotation axis passes North to South and for permanently calculating the heading of the sea vehicle.

4,530,165

DRYING OF SOLVENT-TREATED OBJECTS

Wolfgang O. Tiedemann, Sigtuna, Sweden, assignor to Vico Kemisk Tekniska Fabrik AB, Bandhagen, Sweden

Filed May 23, 1977, Ser. No. 799,787
Claims priority, application Sweden, May 21, 1976, 7605824
Int. Cl.[3] B43L *13/00*
U.S. Cl. 34—32 26 Claims



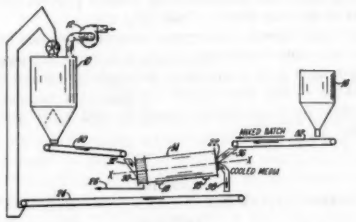
1. A method of drying solvent-treated objects, the method comprising introducing the objects to be dried into a generally enclosed drying space, circulating drying air in the drying space for entraining solvent from the solvent-treated objects, removing air having solvent entrained therein after circulating, providing in the drying space a well-defined drying zone into which the objects to be dried are introduced, establishing a high air flow rate in the drying zone by circulating the drying air at high speed by blowing-in and evacuating drying air, establishing negative pressure in the drying space with greatest negative pressure in the drying zone by withdrawing air having solvent entrained from circulation from the drying zone closely adjacent to a junction between the drying zone and a contiguous transfer zone adapted for introducing and removing objects from the drying zone within the drying space.

4,530,166

PREHEATING PARTICULATE MATERIAL

David M. Miller, Lancaster, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Feb. 27, 1984, Ser. No. 584,028
Int. Cl.[3] F26B *3/24*
U.S. Cl. 34—39 13 Claims



1. A method of heating particulate material including the steps of:

heating glass-ceramic heat transfer media, larger in particle size than the particulate material wherein the glass-ceramic media has a low thermal expansion coefficient and is readily soluable in silicate glass melts;

introducing the hot media into a rotatable container;

introducing particulate material into the container;

rotating the container, during rotation the material and media tumbling and moving over each other in heat transfer relationship; and

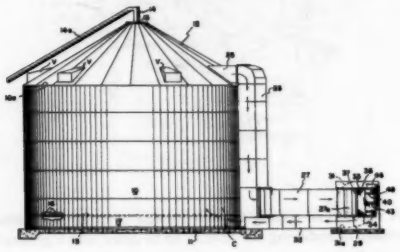
moving the material and media through the container for discharge.

4,530,167

IN-BIN, CONTROLLED ATMOSPHERE, GRAIN DRYING SYSTEMS AND THE LIKE

James R. Hotovy, Columbus, Nebr., assignor to The Wickes Corporation, Santa Monica, Calif.

Filed Apr. 30, 1984, Ser. No. 605,136
Int. Cl.³ F26B *21/08*
U.S. Cl. 34—47 **11 Claims**



1. Improvements in in-bin, controlled atmosphere, drying systems comprising:

a. a storage chamber including a base, a side wall enclosure, and a roof, for holding a supply or column of grain or the like;

b. conduit means near the base thereof for introduring a flow of air to the lower end of the chamber;

c. vent means near the upper end of the chamber for egressing air which has absorbed sufficient moisture from the grain to the atmosphere;

d. a recycling duct leading from the upper end of the chamber back to said conduit means;

e. a humidistat mechanism sensitive to the humidity of the air flow;

f. a proportioning conduit portion communicating with said conduit means at an egress end and having an opposite inlet end with side-by-side inlet portions lying in substantially a common plane and together providing an inlet end of predetermined width, one inlet portion connecting with said recycling duct and the other being open to atmosphere, and said inlet portion connecting with said recycling duct communicating with said proportioning conduit portion over only a part of the said width of said inlet end;

g. and motor driven slide means controlled by said humidistat and movable crosswisely back and forth relative to said width such as to admit more atmospheric air and less recycled air, or less atmospheric air and more recycled air, dependent on the humidity sensed by said humidistat mechanism.

4,530,168

COMBINATION BOOT CARRYING AND DRYING DEVICE

Joseph E. Petre, 25 Annadale St., Armonk, N.Y. 10504

Filed Mar. 16, 1984, Ser. No. 590,113
Int. Cl.³ F26B *25/00*; A47F *7/08*
U.S. Cl. 34—106 **13 Claims**

1. In combination, a boot carrying and drying device, which comprises:

(a) a support;

(b) mounting means secured to the support, said mounting means having a mounting portion;

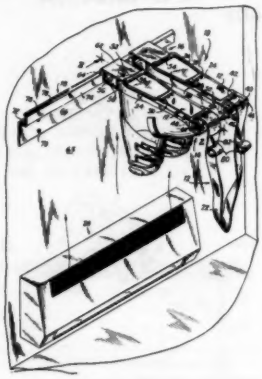
(c) a carrying and mounting means which detachably engages the mounting means, having

(i) a strap;

(ii) first boot engagement means, detachably engagable with one of the heel and toe of the boot;

(iii) second boot engagement means, detachably engagable with the other of the heel and toe of the boot;

(d) said first and said second boot engagement means adjustably attached to said strap, so that different size boots may be accommodated, with a sufficient length of strap remaining to allow the attached boots to be carried by hand or over the shoulder;



(e) one of said first and second engagement means having a mounting portion which detachably grips the mounting portion of said mounting member;

whereby, the strap and boot engagement means may be secured to and adjustably carry any size boot, and may be mounted on the mounting member to allow drying of the interior of the boot.

4,530,169

GAS DISTRIBUTING FLOOR FOR CIRCULATING FLUIDIZED-BED DRYERS OR THE LIKE

Mikio Okawara, Shizuoka, Japan, assignor to Kabushiki Kaisha Okawara Seisakusho, Shizuoka, Japan

Filed Apr. 22, 1983, Ser. No. 487,747
Claims priority, application Japan, Apr. 26, 1982, 57-70152
Int. Cl.³ F26B *17/10*
U.S. Cl. 34—57 E **6 Claims**

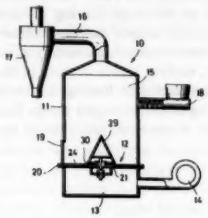
1. A gas distributing floor for a circulating fluidized-bed dryer or the like, comprising:

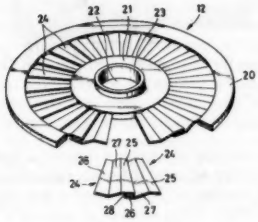
(a) an annular plate;

(b) a circular disc disposed centrally in said annular plate; and

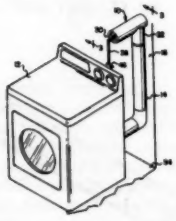
(c) a number of elongate baffling plates joined at opposite ends with, and disposed circumferentially between, said annular plate and said circular disc in overlapping relation to one another, each said baffling plate having a pair of upper and lower portions extending longitudinally thereof and an intermediate portion extending obliquely between upper and lower portions, said upper portion of each baffling plate overlying said lower portion of an adjacent one of said baffling plates so as to define therebetween an elongate orifice for the passage therethrough of gas, each

said lower portion inclining slightly upwardly with respect to the general plane of said circular disc from its intersection with said intermediate portion to its outer extremity.





4,530,170
INSULATED VENT ADAPTOR
Morris J. Green, 224 S. New St., Exton, Pa. 19341
Filed Jun. 25, 1984, Ser. No. 624,279
Int. Cl.³ F26B *11/04*
U.S. Cl. 34—82 **10 Claims**



1. A vent adaptor for connecting the vent of a dryer to an opening provided in a building exterior wall to discharge the dryer effluent comprising

a hollow fitting having a connector leg affixed to the dryer vent in a substantially leak-proof junction and a conduit in fluid communication with the connector leg,

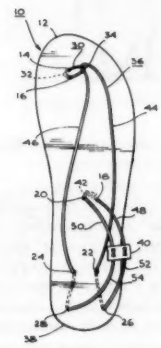
the conduit comprising a storage branch, an insulating branch and a connector to connect the fitting to the building exterior wall at the said opening thereof;

insulating plug means reciprocal within the conduit between a storage position and an insulating position,

at least a portion of the insulating plug means being positioned within the said wall opening when in the said insulating position to prevent the entrance of cold outside air into the building through the wall opening and at least a portion of the insulating means being positioned within the storage branch when in the said storage position to allow the passage of the dryer effluent through the wall opening; and

operating handle means connected to the insulating plug means to reciprocate the insulating means between its said insulating and storage positions.

4,530,171
SANDAL
Bert M. Zabala, 1745 E. Gemini St., West Covina, Calif. 91792
Filed Dec. 16, 1983, Ser. No. 562,201
Int. Cl.³ A43B *3/12*
U.S. Cl. 36—11.5 **9 Claims**



1. An improved sandal including:

a sole having an upper and lower surface and having a heel-supported portion;

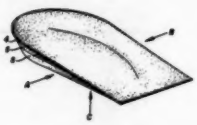
a first thong secured to said sole and forming a loop extending above said upper surface of said sole, said loop being positioned on said sole so as to pass, in use, between the big toe and the next adjacent toe of the wearer of the sandal without encircling either such toe;

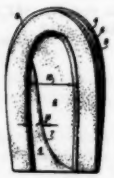
a second thong which is continuous and, centrally of its length, passes through said loop, said second thong having a pair of forward-foot-engaging portions positioned to engage, in use, the upper surface of the foot of the wearer, bilaterally in the region of the top of the foot where the toes join the remainder of the foot, to retain the sandal on the foot;

said second thong having, in addition, first and second instep-engaging portions, each having a pair of ends and each coupled, at its one end, to a respective one of said pair of forward-foot-engaging portions thru said heel-support portion of said sole and secured at its other end to a common point on said lower surface of said sole.

4,530,172
Patent Not Issued For This Number

4,530,173
EXCESSIVE PRONATION CORRECTING DEVICE
Edward G. Jesinsky, Jr., 3432 S. Locust St., Apt. F, Denver, Colo. 80222
Filed Jul. 5, 1983, Ser. No. 510,767
Int. Cl.³ A43B *21/32, 7/16*
U.S. Cl. 36—92 **6 Claims**





1. A pronation correcting device for lifting, rotating and stabilizing the heel, comprising:

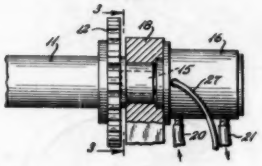
a substantially flat cushion member;

a wedge shaped cushion member secured to and below said substantially flat cushion member which, when said device is positioned in footwear, slopes downwardly in a direction from the rear of the footwear to the front of the footwear and in a direction from the medial side of the footwear to the lateral side of the footwear; and

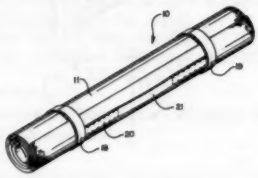
a horseshoe-shaped cushion member secured to and below said wedge shaped cushion member, the bight of said horseshoe-shaped cushion member being positioned adjacent to the rear of the footwear and the legs of said horseshoe-shaped member extending in a direction from the rear of the footwear towards the front of the footwear, an open area defined by said bight and legs of said horseshoe-shaped cushion member receiving a lower portion of said wedge shaped cushion member in response to an application of weight on said pronation correcting device thereby stabilizing the heel while correcting excessive pronation.

4,530,174
DRIVE FOR ELEVATING MECHANISM
Henry W. Hurt, and Charles F. May, both of Lubbock, Tex., assignors to John Barryman Reynolds, Lubbock, Tex., a part interest
Filed Aug. 7, 1984, Ser. No. 638,604
Int. Cl.³ B60P *1/36*
U.S. Cl. 37—8 **4 Claims**

1. Earth moving apparatus comprising a mobile open front dirt carrying container, a scraper blade carried by said container, an endless rigid frame scraper type conveyor carried by said container and having a plurality of flights which sequentially dig into the earth which passes the scraper blade for moving dirt upwardly and rearwardly into said container, a hydraulic motor of the type having a housing and bi-directional capability, said motor having concentrically mounted rotating and stationary members, working vanes in slots in the rotating member, sealing vanes in slots in the stationary member, the stationary member having a plurality of cavities in which the rotating member vanes work, the rotating member having a plurality of vanes, a fluid inlet in the stationary member adjacent one side of each slot therein, a fluid outlet in the stationary member adjacent the other side of each slot therein, whereby the number of power strokes per revolution is the multiplied product of the number of stationary member cavities and the number of vanes on the rotating member, said conveyor having a driven element carried on a shaft for driving the conveyor, said shaft carried on said frame, said motor having an output shaft driven by its rotating member, means mounting said motor housing coaxially with said conveyor shaft, and means directly connecting said motor shaft and said conveyor shaft.



4,530,175
PORTABLE, WEATHERTIGHT DOCUMENT STORAGE AND VISIBLE DISPLAY DEVICE
Brian Wellman, 2247½ N. Shore Rd., Bellingham, Wash. 98226
Filed Aug. 1, 1983, Ser. No. 519,020
Int. Cl.³ G09F *3/18*
U.S. Cl. 40—10 B **11 Claims**



1. A compact, portable, weathertight document storage and visible display device comprising, in combination:

(a) a rectilinear fabric backing member capable of being rolled into and unrolled from a tubular helix;

(b) a plurality of rectilinear envelopes each formed of transparent liquid impervious synthetic flexible sheet material and each being transparent both front and back;

(c) first means for releasably securing said plurality of envelopes to said fabric backing member in overlying relation

thereto along a first edge of each of said envelopes with said envelope first edges disposed in vertically stacked overlying relation one to another;

(d) second means for releasably securing said plurality of envelopes to said fabric backing member along at least a portion of an envelope edge remote from said first edge; and,

(e) said plurality of envelopes each having a resealable access opening along an edge thereof for permitting introduction and/or removal of a document and/or two back-to-back documents into and from the interior thereof and selective retention of such document(s) in weathertight protected condition within each envelope interior while permitting viewing of a document through the transparent sheet material defining both the front and back of said envelope;

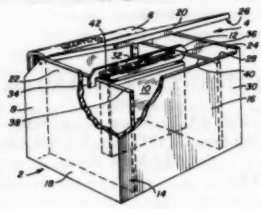
whereby said fabric backing member and said plurality of envelopes can be rolled tightly into a tubular helix with said plurality of envelopes totally closed within said helically rolled fabric backing member when not in use and permitting unrolling of said fabric backing member and said plurality of envelopes into a planar configuration for display of and reference to protected document(s) contained therein, and wherein said second releasable securing means can be released to permit overturning of the uppermost envelope(s) about said first edge for displaying any document visible from the reverse side of said uppermost overturned envelope and/or any document visible in the uppermost one of any underlying envelope.

4,530,176

APPARATUS FOR CATALOGUING PHOTOGRAPHS AND NEGATIVES

Sasson Rejwan, North Woodmere, N.Y., assignor to Berkey Photo, Inc., White Plains, N.Y.

Filed Sep. 27, 1983, Ser. No. 536,210
Int. Cl.³ B42F *21/00*
U.S. Cl. 40—359 **15 Claims**



7. A photograph album comprising:

a first cover leaf having a generally rectangular tab portion at its uppermost transverse edge extending generally the full length thereof, a generally rectangular binding portion foldably connected to and generally coextensive with the lower transverse edge of said tab portion and a generally rectangular photograph covering portion coextensive with and hingedly connected to the lower transverse edge of said binding portion, said binding portion having first and second indentations at the opposite free ends thereof;

a cataloguing means comprising, in combination, said tab portion of said first cover leaf and an index member, said index member causing said first cover leaf tab portion to fold at a generally right angle with respect to said first cover leaf binding portion, whereby an index label is provided along the bound edge of said photograph album;

a stack of generally rectangular photograph mounting tongues, each mounting tongue having first and second indentations at the opposite free ends thereof, said indentations being in substantial registration with the indentations in respectively contiguous mounting tongues in the stack and with the indentations in said binding portion of said first cover leaf;

a second cover leaf having a generally rectangular binding portion at its uppermost transverse edge extending generally the full length thereof and a generally rectangular photograph covering portion coextensive with and hingedly connected to the lower transverse edge of said binding portion, said binding portion having first and second indentations at the opposite free ends thereof and in substantial registration with the indentations in said stack of mounting tongues and said first cover leaf binding portion; and

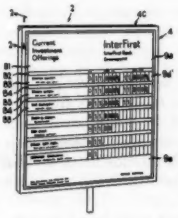
a flexible binding member fitting into said indentations and around said first cover leaf, index member, stack of mounting tongues and second cover leaf for binding said mounting tongues so as to form said photograph album.

4,530,177

SIGN WITH INTERCHANGEABLE CHARACTERS

Michael Kane, River Forest, Ill., assignor to Kane Graphical Corporation, Chicago, Ill.

Continuation of Ser. No. 420,044, Sep. 20, 1982, abandoned. This application Sep. 6, 1984, Ser. No. 648,452
Int. Cl.³ G09F *7/04*
U.S. Cl. 40—621 **16 Claims**



1. A changeable sign comprising: a support wall for changeable sign components, said support wall having on at least one side thereof an initially exposed sign component-receiving surface; said sign component-receiving surface having removably attached thereto a plurality of thin, flat, rectangular, flexible sign component pieces arranged in close edge-to-edge confronting relation and in contiguous rows so as to fill an entire sign-forming area of the sign and so that the sign component pieces from a distance appear to form a single sheet sign having one continuous flat surface; said sign component pieces being of two basic types, one type being indicia-containing sign component pieces having visible from the front faces thereof one or more numeric digits, symbols, and/or alphabet character indicia so as to form alone or with other adjacent sign component piece, numbers, words, and/or the like, and the other type including blank spacer component strips which fit between adjacent rows of indicia-containing sign component pieces, said strips extending substantially the full length of said rows, the sign component pieces in each row encompassing the same vertical height to present spaced, parallel horizontal edges at the top and bottom of each row, and said blank spacer strips also presenting spaced, parallel horizontal edges at the top and bottom thereof confronting the edges of other sign component pieces.

4,530,178

TRANSPARENT HOLDER

Arthur L. Rauscher, Box 421, Gordon, Ga. 31031

Filed Aug. 2, 1983, Ser. No. 519,745
Int. Cl.³ A01K *97/08*
U.S. Cl. 43—26 **11 Claims**

1. A casing for protecting a fishing rod against the elements while permitting it to be selectively removed comprising:

a folded-over sheet of material having an elongated portion, a wide top portion, and a narrow bottom portion and a fold portion;

the elongated portion of the folded-over sheet being joined by a first means for fastening;

said bottom portion of the folded-over sheet being joined by a second means for fastening;

said first means for fastening and said second means for fastening each being adapted to retain the sheet in overlapped condition even while the sheet is under a stress;

a first strip of material having two opposite surfaces, a first surface and a second, detachably adhesive, surface; the first strip being attached to an underlying portion of the folded-over sheet with its detachably adhesive surface facing the sheet;

a second strip of material having two opposite surfaces, a first surface and a second, detachably adhesive, surface; the second strip being fixedly attached to an overlying

portion of the folded-over sheet with its detachably adhesive surface facing away from the sheet;

an interior of the folded-over sheet being formed by the elongated side portion, the fold portion, and the bottom portion; said interior being open at a top portion;

said interior portion being adapted to encase an elongated object;

said folded-over sheet being flexible;

said first strip being fixedly attached to said folded-over sheet such that a portion of said first strip is exposed beyond said top portion;

said second strip being spaced from said top portion;

said folded-over sheet being adapted to be folded over at a point approximately midway between said first strip and said second strip so as to cause engagement of said first strip and said second strip;

said first strip and said second strip being adapted to detachably adhere to one another so as to retain the folded-over sheet in a closed condition.

4,530,179

SALT IMPREGNATED FISHING LURE

Eugene T. Larew, Shadrack Resort, Cape Fair, Mo. 65624

Filed Aug. 26, 1981, Ser. No. 296,427

Int. Cl.³ A01K *85/00*

U.S. Cl. 43—42.06 **20 Claims**

1. In a fishing lure comprising a body part and at least one hook part connected thereto, the improvement wherein said body part is formed of a plastisol of a resin dispersed in an organic solvent, said plastisol being impregnated with sufficient salt to impart a salty taste to said body part.

4,530,180

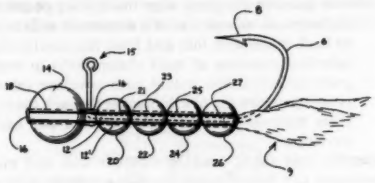
JIG LURE

Leo E. Gwaldacz, Sr., and Leo E. Gwazdacz, Jr., both of P.O. Box 66, Salkum, Wash. 98582

Filed Feb. 8, 1984, Ser. No. 578,193

Int. Cl.³ A01K *85/00*

U.S. Cl. 43—42.28 **13 Claims**



1. A fishing jig comprising:

a bent shank fish hook having a curved, barbed end, a straight shank midsection, a shank bend at generally right angles to said midsection and an eyelet terminus of said shank;

at least one solid element being an aperture therethrough with said solid element arranged on said shank midsection with said shank passing through the solid element aperture;

a metal bead, having an aperture therethrough, positioned abutting the shank bend with said metal bead aperture facing the hook midsection;

a wire, doubly bent to form dual free ends and a bent end;

a pliable element folded through the bent end of said wire;

the dual free ends of the doubly bent wire being threaded through the apertures of both the solid element on the side of the hook curved end and the metal bead and fixed to the metal bead such that the pliable element abuts at least one solid element, and at least one solid element and metal bead abut the shank bend.

4,530,181

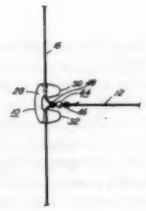
ATTACHMENT DEVICE FOR AN AUXILIARY FISHING LINE

Dale R. Ender, R.R. #2, Buchanan, Mich. 49107

Filed Sep. 22, 1983, Ser. No. 534,726

Int. Cl.³ A01K *91/06*

U.S. Cl. 43—44.88 **9 Claims**



1. A primary and auxiliary fishing line assembly, comprising a body having a normally vertically disposed member and upper and lower arms extending in a spaced relation laterally from said member and forming a generally U-shaped configuration with said body member, passage means extending through each of said arms in alignment with one another, a primary fishing line extending singly through and slidably received in said passage means of said arms, an auxiliary fishing line having an end disposed adjacent said body, and an attachment means secured to said auxiliary line end and having a part

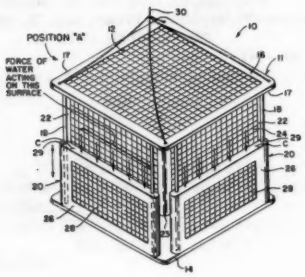
with a hole therethrough slidably received on said primary fishing line in the space between said arms for pulling said main fishing line into a generally V-shaped configuration between said arms, thereby releasably locking said auxiliary line at any desired position on the main line for trolling.

4,530,182

CRAB TRAP

Charles Ponzo, 12 Abby La., Shirley, N.Y. 11967

Filed Dec. 13, 1983, Ser. No. 560,912
Int. Cl.³ A01K *69/06*
U.S. Cl. 43—102 **7 Claims**



1. A crab trap which comprises:
(a) a base member;
(b) a perforated enclosure having an open bottom and a top portion, said top portion having a continuous flange extending outwardly from said enclosure, said top portion being of size and shape substantially identical to said base member;
(c) a plurality of guide members coupling said flange of said top portion to said base member such that said top portion of said enclosure is parallel to said base member;
(d) a plurality of buoyant doors, each said door slideably supported on two said guide members spaced parallel apart, distance between said open bottom of said enclosure and said base member being less than height of said doors so that when said crab trap is submerged within water said doors will float up to said flange of said top portion, opening said crab trap allowing a crab to enter; and
(e) a flexible hoist line connected at each end to a corner of said top portion of said enclosure so that when said crab trap is pulled up force of said water will push down said doors closing said crab trap entrapping said crab within.

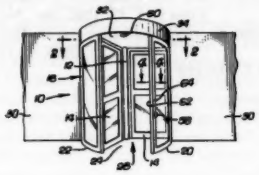
4,530,183

REVOLVING DOOR SYSTEM

Stanley R. Heise, Blaine; Michael D. Blackston, Brooklyn, both of Minn.; Michael B. Zekich, and John L. B. Parselle, both of Pasadena, Calif., assignors to Heise Manufacturing Co., Inc., Minneapolis, Minn. and Related Energy & Security Systems, Inc., Evansville, Ind.

Continuation of Ser. No. 353,165, Mar. 1, 1982, Pat. No. 4,475,308. This application Aug. 1, 1984, Ser. No. 636,576
The portion of the term of this patent subsequent to Oct. 9, 2001, has been disclaimed.
Int. Cl.³ E05D *15/02*
U.S. Cl. 49—42 **9 Claims**

1. A security door system for permitting passage of persons therethrough in one authorized direction while preventing persons from trying to pass therethrough in the other unauthorized direction, comprising:
a central axis of rotation;
a plurality of at least 3 wings circumferentially spaced about and rotatable about the axis;
a pair of upright opposing curved panels disposed in facing spaced apart relationship to define a partially enclosed region bounding the wings and defining opposing first and second openings;
electrically operated means for rotating the wings about the axis in first and second rotating directions;
means for actuating the door to turn in a first rotating direction to permit an authorized person to pass through the system;
means for detecting the presence of a person attempting to pass through the system in the opposite unauthorized direction.



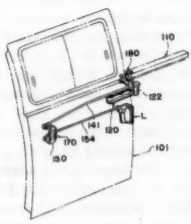
means responsive to said detecting means for automatically stopping the rotation of the door and reversing its rotating direction before the unauthorized passage is completed to back the person out toward their point of entry; and
means for automatically re-enabling the rotation of the door in the first rotating direction when the unauthorized person is no longer detected, said stopping, reversing and re-enabling functions being performed by said system without human intervention.

4,530,184

SLIDING TYPE DOOR ASSEMBLY

Takayo Chikaraishi, Kawasaki, and Hiroshi Itoh, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Continuation of Ser. No. 292,165, Aug. 12, 1981,. This application Nov. 10, 1983, Ser. No. 550,624
Claims priority, application Japan, Aug. 30, 1980, 55-119010; Aug. 30, 1980, 55-120219; Aug. 30, 1980, 55-120221
Int. Cl.³ E05D *15/10*
U.S. Cl. 49—213 **8 Claims**



1. A sliding door assembly for a vehicle, comprising:
a guide rail fixed to the vehicle;
a door movable along the guide rail between its closed position and an open position;
a guide follower attached to the door so that the guide follower can follow the door along the guide rail to open or close the door;
a brake mechanism for applying braking power to the door by controlling movement of the guide follower in relation to the door; and
a brake manual-release mechanism connected to the brake mechanism for manually releasing the brake mechanism;
the guide follower including a base bracket affixed to the door, a roller bracket supporting the brake mechanism and hinged to the base bracket, a sliding roller rotatably at-

tached at one end portion of the roller bracket for rolling movement on the guide rail so as to support the door in a vertical direction, and a guide member for controlling movement of the door in a lateral direction.

4,530,185

AUTOMATIC DOOR OPENING AND CLOSING DEVICE

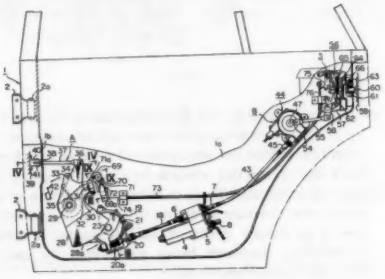
Masaichi Moriya, Chigasaki; Tatsuyuki Takaishi, Yokohama; Haruo Mochida, Yokohama, and Yoshimitsu Takeda, Yokohama, all of Japan, assignors to Ohi Seisakusho Co., Ltd. and Nissan Motor Co., Ltd., both of Yokohama, Japan

Filed Oct. 27, 1982, Ser. No. 436,968

Claims priority, application Japan, Oct. 29, 1981, 56-172152

Int. Cl.³ E05F *15/12*

U.S. Cl. 49—280 **8 Claims**



1. An automatic door opening and closing device for a door on a automobile body, said door being connected to said body at one door edge by at least one hinge and at the other door edge said door is locked to said body by engagement of a striker on said body with a latch of a door lock on said door, comprising:

means for opening and closing said door by applying respectively forces of opposite direction between said body and said one door edge, said forces acting outside the pivot shaft of said at least one door hinge and causing said door to pivot relative to said body;

auxiliary means for door closure, said auxiliary means operating said latch of said door lock to fully engage said lock latch with said striker;

means for determining the position of said latch relative to said striker, said means for determining indicating substantially the first contact, between said latch and said striker at a half latch position during closing of said door from an open position;

drive means for selectively driving either said means for door opening and closing or said auxiliary means for door closing, said drive means being adapted to operate during door closing to drive said mans for door opening and closing while said striker and latch are disengaged in response to said disengaged condition being indicated by said means for determining, and said drive means driving said auxiliary means for door closing to operate said latch when contact between said latch and striker is detected by said means for determining at said half-latch position, operation of said auxiliary means being adapted to continue to close said door until a full-latch position wherein said latch fully engages said striker;

a push rod, said forces of opposite direction being applied by pulling and pushing said rod, said push rod at one end being pivotably connected to said automobile body, the other end of said push rod being driven through said drive means, said drive means being connected to said door;

said door opening and closing means is comprised of a speed reduction unit incorporating an electromagnetic clutch therein and connected to said drive means, a sector gear connected to said speed reduction unit and pivoted at its central part to said door, and a rotatable arm pivoted to said door at its one end, said rotatable arm being connected to said sector gear at a middle part of said rotatable arm and being pivoted to one end of said push rod at its other end, said one end of the push rod being subject to moving substantially along the axial line thereof in response to the rotation of said sector gear.

4,530,186

WEATHER STRIP FOR VEHICLE WINDOWS

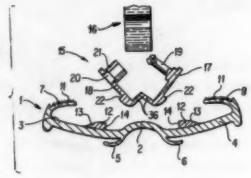
Henri Guillon, Vaux sur Seine, France, assignor to G.I.E. Technistan, Paris, France

Filed Oct. 13, 1983, Ser. No. 541,681

Claims priority, application France, Aug. 25, 1983, 83 13717

Int. Cl.³ E05D *15/16*

U.S. Cl. 49—441 **9 Claims**



1. A weather strip for vehicle window constructions including a channel guide rail and an insert attached to the edge margin of a glass pane and having a laterally extended surface, comprising in combination:

an elongated body member of resilient elastomeric material including a transverse section configuration of generally uniform thickness adapted to be folded when inserted into said channel guide rail to provide a base portion and spaced side wall portion;

a protrusion of hard elastomeric material on at least one side wall portion,

said protrusion having a surface spaced from said base portion to form a side groove adapted to receive the laterally extending surface on said insert to slidably retain said edge margin of said glass pane;

and means on said body member adapted to hold said body member in said channel rail and in sealing relation with surfaces of said edge margin of said glass pane.

4,530,187

DRESSING DEVICE FOR GRINDING WHEELS

Tsuyoshi Koide, Toyota, and Toshio Maruyama, Kariya, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 2, 1983, Ser. No. 519,719

Claims priority, application Japan, Aug. 31, 1982, 57-151427

Int. Cl.³ B24B *53/14*

U.S. Cl. 51—165.87 **4 Claims**

1. A dressing device for a grinding wheel rotatably supported on a wheel head of a grinding machine, comprising:

a tool support movable toward the outer surface of said grinding wheel;

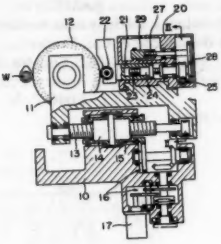
a dressing tool carried on said tool support for dressing said grinding wheel;

feed means connected to said tool support for moving said tool support toward said grinding wheel so as to bring said dressing tool into engagement with said grinding wheel;

detection means for detecting the diameter of said grinding wheel and producing an output signal; and

a control means connected to said feed means and responsive to said output signal from said detection means for controlling said feed means in such a manner such that the

cutting depth of said dressing tool into said grinding wheel in each dressing operation is progressively increased in



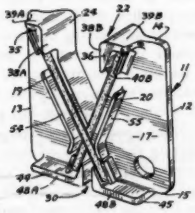
connection with a decrease in the diameter of said grinding wheel.

4,530,188

SHARPENING APPARATUS

Louis N. Graves, Anoka, Minn., assignor to Louis N. Graves Company, Inc., Anoka, Minn.

Filed May 19, 1983, Ser. No. 496,412
Int. Cl.³ B24D *15/08*
U.S. Cl. 51—214 **17 Claims**



1. A sharpening apparatus comprising:

a body having a proximal face and a distal face;

a pair of thin, elongate sharpening rods;

clip means on the distal face of the body releasably mounting the rods in upright crossed relationship forming first and second diagonally opposite acute interior V-shaped corners;

said body having a major access opening exposing portions of the first and second rods proximate the first V-shaped corner for access from the proximal side of the body by a blade to be sharpened;

said body having a minor access opening opposite the major access opening exposing portions of the first and second rods proximate the second V-shaped corner for access from the proximal face of the body;

said major access opening extending inward from a first end of the body, said minor access opening extending inward from a second end of the body opposite the first end; said first and second rods intersecting on the distal face of the body toward the second end, said major access opening including a mouth comprised of parallel spaced apart edges disposed in covering relationship to ends of the first and second rods as viewed from the proximal side, and a V-shaped portion defined by converging edges parallel to and positioned to expose facing portions of the first and second rods associated with the first acute interior V-shaped corner from the proximal face of the body;

said minor access opening being smaller than the major access opening and comprised as a U-shaped notch extended inward from the second end sufficient to expose the portions of the first and second rods proximate the second interior V-shaped corner from the proximal face of the body;

said clip means including a first pair of L-shaped shoulders disposed on the first end of the body in straddling relationship to the mouth of the major access opening, each L-shaped shoulder having a first leg contiguous with the first end, and a second leg contiguous with an edge of the mouth of the major access opening, and a diagonal surface disposed at an inclination parallel to the intended inclination of a rod, a linear clip member spaced from and parallel to each diagonal surface forming with the diagonal surface a pocket for releasable receipt of the end of a rod;

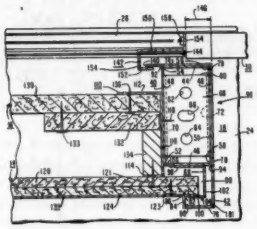
a second pair of L-shaped shoulders disposed on the second end of the body in straddling relationship to the minor access opening, each having a first leg contiguous with the second end of the body, a second leg contiguous with an edge of the minor access opening, and a diagonal surface disposed at an inclination parallel to the intended inclination of a rod, second linear clip members parallel to and spaced from the diagonal surfaces of the second L-shaped shoulders providing seats for opposite ends of the first and second rods.

4,530,189

DOOR ENTRANCE

Charles E. Randall, Monroe Township, Monroe County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 25, 1983, Ser. No. 488,308
Int. Cl.³ B66B *9/00*
U.S. Cl. 52—30 **6 Claims**



1. A fire resistant elevator hatchway door entrance suitable for openings in dry wall construction up to and including 10 feet in height, including a head jamb, first and second side jambs, and at least one slidably mounted door panel having leading and trailing edges, the improvement, comprising:

each of said side jambs including first and second upstanding, oppositely facing channel members, each having first and second leg portions which extend toward the other channel member, and bight portions which are in spaced, parallel relation, said bight portions joining their respective first and second leg portions with first and second right angle bends,

the bight portion of said second channel member having a width dimension exceeding that of the first channel member,

said first and second leg portions of the first channel member each being bent towards the other leg portion with right angle bends to form first and second aligned flanges,

said first channel member being disposed within the opening defined by the first and second leg portions of the second channel member,

means joining the first and second channel members with the first leg portion of the second channel member in contact with the entire first leg portion of the first channel member, the right angle bend in the first leg portion of the first channel member nested with the first right angle bend of the second channel member, and with the first and second flanges of the first channel member in contact with the

bight portion of the second channel member, to cooperatively define a structural box beam, and with the second leg portion spaced to define a pocket for receiving the wall which defines the opening,

said second leg portion of the second channel member including first and second integral flanges, with the first flange being parallel with the second leg portion, and with the second flange being perpendicular to and joining the first flange and associated second leg portion,

and a plurality of spaced, U-shaped jamb brackets, each having first and second leg portions and a connecting bight portion, with the first leg portion of each jamb bracket being fixed to the second leg portion of the first channel member, and with its second leg portion being fixed to the first flange of the second channel member,

wherein the bight and second leg portions of the second channel member define the jamb depth and reveal, respectively, of the associated side jamb, the second flange functions as a wall return for the reveal, and the bight of the first channel member is adapted to receive and shield an associated J-strut which interfaces the entrance and adjacent dry wall construction.

4,530,190

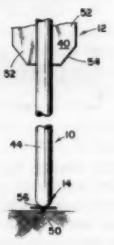
SELF-ANCHORING FENCE POST AND METHOD OF INSTALLING SAME

Jack P. Goodman, 4000 Holland Dr., Wheat Ridge, Colo. 80033

Filed Dec. 21, 1983, Ser. No. 563,805

Int. Cl.³ E21B *11/02*; E02D *5/80*

U.S. Cl. 52—165 **8 Claims**



1. The subassembly for use with a driving tool having a shaft with a lower end and a downwardly-facing shoulder spaced thereabove to seat and anchor a post in the ground which comprises: a plate of a shape and size adapted upon being placed on the lower end of a driving tool and driven into the ground to produce a posthole sufficiently oversized with respect to said tool to permit ready removal thereof, the posthole produced by said plate also being of a shape and size to permit ready insertion of a post therein while at the same time essentially preventing sidewise movement thereof, and said plate when left at the bottom of said posthole defining a base adapted to support a post resting atop thereof; and, an anchor member detachably connectable to the driving tool for burying same in the ground while the posthole is being driven and for anchoring a post within said posthole, said member comprising a rigid blade of a width and length at least several times greater than the thickness of the post it is to anchor substantially bisected by a vertically-disposed groove sized to receive both the driving tool and post when detachably connected thereto so as to maintain the orientation therebetween.

4,530,191

ISOTHERMIC WALL WITH THREE DIMENSIONAL FRAMEWORK AND PROCESS OF CONSTRUCTING SAME

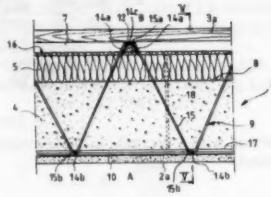
Arsène G. Boisbluche, Juvigny sous Andaine, France, assignor to Sambuchi-Boisbluche et Cie, France

Filed Feb. 1, 1982, Ser. No. 344,756

Claims priority, application France, Feb. 9, 1981, 81 02514

Int. Cl.³ E04C *2/26*

U.S. Cl. 52—309.7 **15 Claims**



1. A central part assembly adapted to be used in an isothermic wall system of the type including a pair of finishing coverings, said central part assembly being disposed between said two finishing coverings, said central part assembly comprising:

a bearing wall;

a heat insulating layer disposed on one side of said bearing wall, and made of a solid insulating material;

a three-dimensional framework comprising a plurality of substantially parallel, rectilinear rods and a plurality of sinuous wires for supporting said rods, said sinuous wires being disposed in substantially parallel, spaced-apart planes and having a first plurality of edge tips defining a first longitudinal face of said framework supporting the first of said finishing coverings and a second plurality of edge tips defining a second longitudinal face of said framework supporting the second of said finishing coverings, said wires supporting a first plurality of said rods in a first plane spaced from said first plurality of edge tips at a distance less than the thickness of said bearing wall, and a second plurality of rods in a second plane substantially parallel to said first plane, said framework being partially disposed in said bearing wall so that said first plurality of rods and said first edge tips are spaced from said one side of said bearing wall;

wherein said heat insulating layer is disposed in said framework between said first plurality of rods and said one side of said bearing wall so that when said first finishing covering is supported by said first plurality of edge tips an air space is provided between said heat insulating layer and said first finishing covering.

4,530,192

GLAZING SUPPORTS

Helmut Ginster, Viersen, Fed. Rep. of Germany, assignor to Draftex Development AG, Zug, Switzerland

Filed Mar. 7, 1983, Ser. No. 472,951

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1982, 8209097

Int. Cl.³ E06B *3/62*

U.S. Cl. 52—397 **7 Claims**

1. A window glass mounting arrangement, comprising

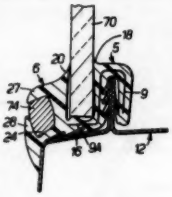
flexible material in strip form and sized to extend substantially around the whole of the opening for the window glass and which is formed to define first and second channels extending longitudinally along the length of the strip and arranged substantially side-by-side and with their mouths facing in opposite directions,

the first channel being sized to fit over and grip a support member surrounding the window opening so that the second channel then runs alongside the window opening for receiving the window glass,

a relatively rigid stiffening member,

the wall of the second channel furthest from the first channel defining a longitudinal slot sized to receive the stiffening member whereby the stiffening member when so received stiffens that wall so as to secure the window glass in the second channel, and

a flexible reinforcing carrier completely embedded in the flexible material,



the flexible reinforcing carrier extending for the full length of the strip and of which a portion is generally channel-shaped and embedded in that part of the material defining the first channel and of which another, integral, portion is embedded in that part of the flexible material forming the base of the second channel.

4,530,193

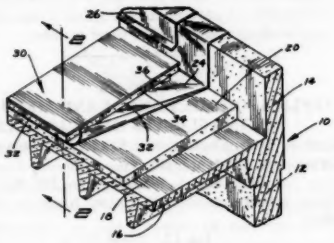
BUILT-UP ROOF STRUCTURE AND METHOD OF PREPARING ROOF STRUCTURE

Gregory J. Ochs, Forest Lake, Minn., assignor to Minnesota Diversified Products, Inc., New Brighton, Minn.

Filed Jul. 16, 1984, Ser. No. 631,082

Int. Cl.³ E04B *5/00*; E04D *3/35*

U.S. Cl. 52—408 **19 Claims**



2. A roof structure for installation on a roof deck having an upper surface, said roof structure including:

A. an insulating layer of relatively soft surfaced, foamed, closed cell insulation panels supported by the upper surface of the deck;

B. a water impermeable membrane laid loosely over the insulating layer, said membrane having an upper face and a lower face;

C. a protective layer of relatively strong, foamed, closed cell protection panels positioned over the membrane and having fissures therebetween, each of said protection panels having an upper and a lower face; and

D. means for fixedly positioning the panels of the protective layer against displacement with respect to each other by wind or water.

4,530,194

BRACKET

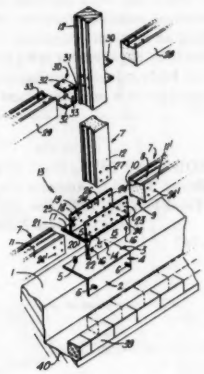
Derek Linton, and Pam M. Linton, both of Marlow, England, assignors to Linton Systems Limited, England

Filed Jan. 17, 1983, Ser. No. 458,214

Claims priority, application United Kingdom, Sep. 21, 1982, 8226960

Int. Cl.³ E04B *1/38*

U.S. Cl. 52—712 **30 Claims**



1. A bracket for use at a node point in a framework between two horizontal members and a vertical member, said bracket comprising a first rigid, preformed channel member having a base and two upstanding side walls, the longitudinal axis of which is aligned with the axis of said two horizontal members, said channel member being dimensioned to accommodate the base of the substantially vertical member, and also to accommodate the ends of the horizontal members on opposite sides of said vertical member, fastening means for fastening said vertical member and said horizontal members to said channel member in engagement with said base, and means being provided for mounting said channel member on a sub-structure, said mounting means including a first mounting arm extending outwardly of one side wall and a second mounting arm extending downwardly from the other side wall.

4,530,195

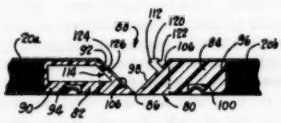
SPACER FRAME FOR AN INSULATING GLASS PANEL AND METHOD OF MAKING THE SAME

Edmund A. Leopold, Hudson, Ohio, assignor to Glass Equipment Development, Inc., Twinsburg, Ohio

Continuation-in-part of Ser. No. 136,872, Apr. 3, 1980, abandoned. This application Dec. 4, 1981, Ser. No. 327,579

Int. Cl.³ E06B *3/24*; B23P *11/00*

U.S. Cl. 52—726 **19 Claims**



1. A spacer frame assemblage for use in construction of an insulating glass panel comprising:

(a) first and second axially aligned spacer frame segments;

(b) sealant material disposed along at least one side of said frame segments; and,

(c) a connector between said frame segments comprising:

(i) a first body portion secured to the first frame segment;

(ii) a second body portion secured to the second frame segment;

(iii) hinge means connecting said first and second body portions together for enabling said frame segments to remain in axial alignment while said sealant material is applied and providing for flexing movement of one frame segment relative to the other frame segment from the axially aligned position; and,

(iv) connecting means for securing said body portions in position when said body portions are hingedly moved to predetermined relative positions, said connecting means comprising an element projecting from one body portion and in latching engagement with said other body portion when said body portions are secured together with said frame segments in a predetermined flexed position.

4,530,196

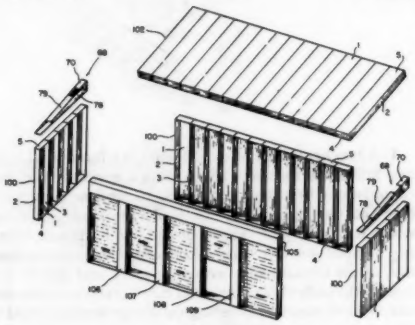
MODULAR BUILDING STRUCTURE

Frank L. O'Bryan, 12160 E. Amherst Cir., Aurora, Colo. 80012

Filed Feb. 16, 1983, Ser. No. 467,035

Int. Cl.³ E04B *1/00*

U.S. Cl. 52—747 **9 Claims**



1. A method of forming a wall structure for a building from a series of structural elements formed from multi-layered corrugated fiberboard comprising the steps of:

providing a sheet of multi-layered corrugated fiberboard having at least two layers of corrugated flutes disposed between at least three substantially flat facing sheets;

cutting said sheet to form a blank of said multi-layered corrugated fiberboard;

forming grooves in said blank at predetermined locations to divide said blank into a plurality of panel portions including a substantially rectangularly shaped face panel portion, two substantially rectangularly shaped side panel portions disposed adjacent to elongated sides of said face panel portion and two substantially rectangularly shaped end panel portions;

aligning said grooves with said blank such that said corrugated flutes extend laterally in a substantially parallel direction to said elongated sides of said rectangularly shaped face panel portion and elongated sides of said two substantially rectangularly shaped side panel portions;

folding said blank along said grooves such that said side panel portions and said end panel portions are substantially normal to each other and said face panel portion to form a shallow rectangularly shaped box-like structural element;

attaching a plurality of said shallow rectangularly shaped box-like structural elements along said side panel portions to form said wall structure for said building such that said elongated sides of said rectangularly shaped face panel portions are adjacently disposed and said face panel portions extend the entire height of said wall structure with said corrugated flutes aligned with a substantially vertical orientation to provide sufficient compressive strength to support said building.

4,530,197

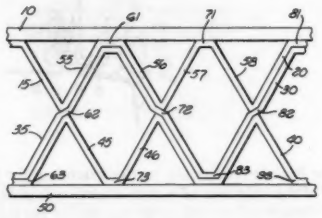
THICK CORE SANDWICH STRUCTURES AND METHOD OF FABRICATION THEREOF

Gilles Rainville, Northridge, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 29, 1983, Ser. No. 508,780

Int. Cl.³ E04C *2/32*

U.S. Cl. 52—797 **22 Claims**



1. A metallic sandwich structure comprising:

a first face sheet;

a second face sheet spaced from said first face sheet;

a first core sheet member positioned between said face sheets and metallurgically bonded at a plurality of first face nodes to said face sheets such that said first core sheet member extends transversely and linearly with substantially no eccentricity from one face sheet to the other in alternate sequence; and

a second core sheet member positioned between said face sheets and metallurgically bonded at a plurality of second face nodes to said face sheets such that said second core sheet member extends transversely and linearly with substantially no eccentricity from one face sheet to the other in alternate sequence, said second face nodes positioned in alternate sequence along respective face sheets with said first face nodes, said second core sheet member being metallurgically bonded to said first core sheet member at a plurality of core nodes such that transverse support is provided to said first core sheet member.

4,530,198

APPLICATOR MECHANISM AND METHOD FOR FITTING SLEEVES ONTO ARTICLES

Philippe Le Bras, Chateauroux, France, assignor to The Mead Corporation, Dayton, Ohio

Filed Aug. 4, 1983, Ser. No. 520,355

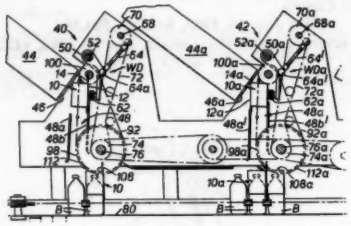
Claims priority, application United Kingdom, Sep. 1, 1982, 8224932

Int. Cl.³ B65B *21/14*

U.S. Cl. 53—48 **3 Claims**

1. Mechanism for applying a sleeve (10) downwardly to at least one moving article (B) so that the article is introduced through an open base of the sleeve, which apparatus comprises means to continuously move said articles, supply means (44) above said article moving means for accomodating a plurality of said sleeves in collapsed condition, erecting means (WD) to bring each sleeve sequentially into a set-up condition and present the set-up sleeve for downward transfer towards the article to be sleeved, transfer means (96–104) to transfer said sleeve downwardly and applicator means (106–112) for fitting said transferred sleeve around said article, said applicator means being operable to execute both a downward and a forward motion to the sleeve such that the forward motion of the sleeve is substantially synchronised with that of the article conveyed beneath the mechanism during fitment of the sleeve onto said article, said transfer means comprising a pair of

endless belts (90,92) spaced apart to receive a sleeve therebetween and having a series of inwardly directed lugs (102,104) for engaging the upper edge of said sleeve and pushing said sleeve downwardly, and a sleeve guide (48) including guide plates (48a,48b) through which a set-up sleeve is driven by said



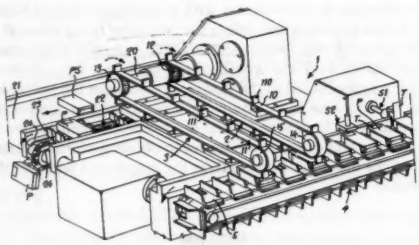
lugs, said applicator means comprising cam elements (106,108) carried by rotatable cam discs (110,112), means to rotate said cam disk so that said cam elements move through an arcuate path and wipe across the upper edge of said sleeve to apply a downward and forward pushing force to a transferred sleeve.

4,530,199

DISCARDING DEVICE FOR DISCARDING DEFECTIVE CIGARETTE PACKS

Renato Manservisi, Bologna, and Roberto Roffi, Casalecchio di Reno, both of Italy, assignors to SASIB S.p.A., Bologna, Italy

Filed May 17, 1982, Ser. No. 378,820
Claims priority, application Italy, May 19, 1981, 12529 A/81
Int. Cl.³ B07C *5/02*
U.S. Cl. 53—53 **5 Claims**



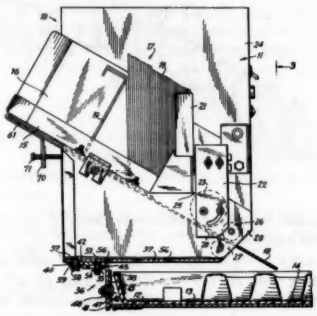
1. A discarding device for discarding cigarette packs which have not been provided with a label or duty stamp, from a cadenced flow of such packs, characterized by the fact that said device comprises an operational endless feeding conveyor (4) driven step-by-step, said conveyor (4) carrying an orderly plurality of open seats or containers (5) each adapted to receive one cigarette pack and which are equally-spaced with respect to each other and in phase relationship with the step-by-step movement of the conveyor (4); a labelling station (S1) where the labels are applied to the packs in the containers; a checking station (S2) to detect the presence of the label on a pack, a discard conveyor (2) for discharging the unlabelled packs from the feeding conveyor, and a transfer conveyor (3) to convey correctly labelled packs from the operational feeding conveyor to a further delivery conveyor (22); said discard conveyor and said transfer conveyor being arranged transversally with respect to the said operational feeding conveyor, and being operationally controlled so as to operate in the dwell periods of the step-by-step movement of the feeding conveyor for causing said discard conveyor to remove from said containers the unlabelled defective packs to be discarded and said transfer conveyor to remove the regular correctly labelled packs to be fed to the further delivery conveyor.

4,530,200

DISPENSING ARRANGEMENT FOR ADVERTISING COUPONS

Richard W. Prewer, Markham, Canada, assignor to International In-Store Sales Limited, Markham, Canada

Filed Jun. 8, 1983, Ser. No. 502,335
Int. Cl.³ B65H *5/06;* **B65B** *61/20*
U.S. Cl. 53—157 **25 Claims**



1. An arrangement for dispensing articles of flexible sheet material into upwardly open containers, comprising

means for bounding a channel for accommodating a stack of the articles in their folded state and for individually guiding the folded articles toward a dispensing end of said channel that is situated upwardly of the respective container during the dispensing operation, said channel having a bottom surface which slopes downwardly toward said dispensing end of said channel;

means for individually withdrawing the folded articles from said stack and for advancing the same toward and beyond the dispensing end of said channel during the dispensing operation for dispensing the respective folded articles into the respective containers; and

a support body which supports said bounding means, and means for holding said support body at a predetermined position relative to the respective container at least during the dispensing operation, including a support assuming a predetermined position relative to the container during the dispensing operation, and means for mounting said support body on said support for displacement relative to the position of the container during the dispensing operation in two horizontal directions for adjustment of the position of said dispensing end of said channel relative to the container, and for maintaining said support body in the selected adjusted position thereof.

4,530,201

METHOD AND AN APPARATUS FOR PACKAGING ARTICLES IN INDIVIDUAL WRAPPINGS

Halvard I. Carlsson, Egnahemsvägen 6, S-445 00 Surte, Sweden

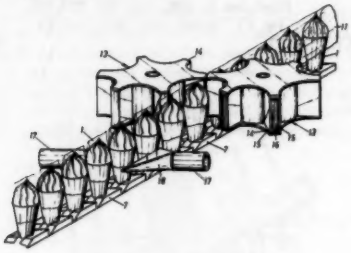
Filed Jan. 6, 1982, Ser. No. 337,504
Claims priority, application Sweden, Feb. 17, 1981, 8101059
Int. Cl.³ B65B *11/00*
U.S. Cl. 53—397 **9 Claims**

1. An improved method of packaging articles such as ice cream cones having conical bases formed with upwardly diverging walls and a softer filling in their upper end in individual wrappings, the improvement comprising the steps of

applying a single web of a continuously supplied shrinking foil over the top of said articles and draping down their sides and advancing said foil web together with said articles with the lengthwise edges of said foil web on either

side of said articles extending down over the conical portions of said articles,

severing said foil web intermediate each one of said articles into foil portions by fusing together and burning off the downwardly extending position of said foil ahead of and behind said articles as seen in the direction of advancement of said articles, such that said foil portions form



individual wrappings relatively loosely enclosing the discrete articles, and

heating only a lower part of the part of each individual wrapping that covers said conical part of said articles, whereby said wrapping will be heat-shrunk about the lower portion of said article and leaving the remaining part relatively loosely enclosed.

4,530,202

CONTAINER FILLING MACHINE AND METHOD

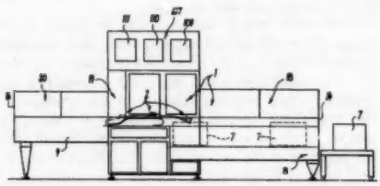
Roger M. Powell, Camberwell; Steven Marshall, Mentone, and Philip D. Waterworth, Croydon North, all of Australia, assignors to ACI Australia Limited, Melbourne, Australia

Filed Jan. 10, 1983, Ser. No. 457,063

Claims priority, application Australia, Jan. 18, 1982, PF2319; Jan. 28, 1982, PF2475

Int. Cl.³ B65B *55/04*

U.S. Cl. 53—426 **51 Claims**



36. A method of filling flexible containers under aspetic conditions, each container having a spout adapted to be closed by a separable cap and a plurality of the flexible containers being joined together end-to-end to form a continuous row of containers, said method including: packaging the joined row of containers in an outer container and sterilizing the row of containers and the interior of the outer container; placing the packaged row of containers in a loading station maintained under aseptic conditions and subjecting the outer container to sterilization in the loading station; opening the outer container and feeding the joined row of containers packaged therein one by one to a filling station, the filling station being provided with a continuous stream of sterilized gas which maintains the filling station at a pressure at least marginally above atmospheric pressure; subjecting each separable cap and spout to a sterilization operation by sterilizing the separable caps and spouts by irradiation with sterilizing radiation; removing the cap and filling each container at the filling station; replacing each cap; and, feeding each filled container to a discharge station.

4,530,203

LEAF DISTRIBUTION MEANS

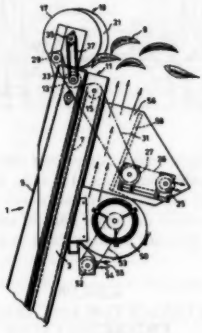
Ben De Cloet, Tillsonburg, Canada, assignor to De Cloet Ltd., Ontario, Canada

Filed Jun. 16, 1983, Ser. No. 504,884

Claims priority, application Canada, Mar. 9, 1983, 423225

Int. Cl.³ A01D *45/16*

U.S. Cl. 56—27.5 **20 Claims**



1. In a harvester having a discharge means adapted to discharge leaves into a container the improvement comprising a set of rolls located over the discharge means positioned to intercept a substantial portion of leaves discharged, the rolls being angled with respect to each other to direct the leaves radially outward from the discharge means over the width of the container; in combination with a fan means located below the discharge means and before the container being adapted to blow air under the discharged leaves to extend the trajectory of the leaves over the length of the container by a distance roughly proportional to the flowrate of air from the fan means from time to time and a control means adapted to control the flowrate of air from time to time in a predetermined pattern to control the trajectory of the leaves to obtain uniform distribution of the discharged leaves over the length and width of the container.

4,530,204

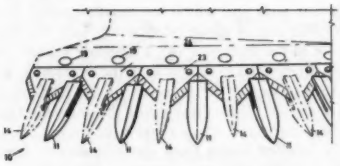
KNIFE GUARD FILLER FINGERS

Donald G. Brooks, 12 O'Malley St., Osborne Park, Australia 6017

Filed Aug. 27, 1984, Ser. No. 644,477

Int. Cl.³ A01D *55/02*

U.S. Cl. 56—298 **9 Claims**



1. For use on a grain harvester cutting platform having as original equipment a plurality of knife guard fingers which project forwardly of mounting lugs in spaced relationship with one another, a knife bar having drive means which reciprocally drives it across the cutting platform and knives thereon which co-operate with the knife guard fingers to sever the stalks of a

grain harvester crop, and respective nut and bolt assemblies securing the lugs to the cutting platform:

a filler finger assembly comprising a mounting plate, surfaces defining rearwardly directed and rearwardly open slots on the mounting plate of such size and shape that the mounting plate is positionable over a plurality of said bolts and beneath said lugs to thereby be secured to said cutting platform,

a plurality of spaced parallel support bars each extending forwardly of the mounting plate and each being between adjacent said slots therein, and a plurality of forwardly projecting fingers carried by respective said support bars.

4,530,205

METHOD AND APPARATUS FOR MAKING STRANDED WIRES OR CABLES

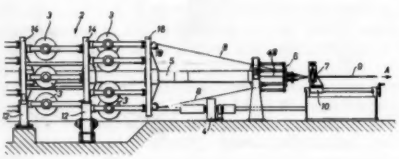
Ernst Seiler, Romanshorn, Switzerland, and Wilhelm Lang, Lindau, Fed. Rep. of Germany, assignors to Fatzer AG, Romanshorn, Switzerland

Filed Sep. 9, 1983, Ser. No. 530,487

Claims priority, application Switzerland, Sep. 14, 1982, 5435/82

Int. Cl.³ D07B *5/10, 3/00, 7/00*

U.S. Cl. 57—9 **17 Claims**



1. Method of making stranded wires, cables, ropes or the like having

a plurality of strands (**8**) supplied in the form of wires having essentially circular cross section, said plurality of strands being guided to respective guide means (**18**) for wrapping about a central or inner core (**48**) at a stranding position, comprising the steps of

deforming the supplied strands of essentially circular cross section to assume the shape of, in cross section, approximately truncated wedge shape, while simultaneously radially orienting said so deformed strands to impart an angular orientation to said strands about an angle corresponding at least approximately to the spiral angle of the strand when assembled about the central core (**48**);

supplying the strans (**8**) having, in cross section, said approximately truncated wedge-shaped form to the central core;

and laying the strands spirally about the central or inner core.

5. Apparatus according to claim **4** wherein the holding means secure the dies (**20**) to the carrier plate (**6**) for pivoting, or rotary movement about an axis (**34**) extending at right angles to the longitudinal direction of the die opening;

and further including rotary adjustment means (**32**) to permit rotational adjustment of the dies (**20**) to impart said angular orientation to the strands about said predetermined angle.

4,530,206

STRINGS FOR TENNIS RACKETS AND RACKETS EQUIPPED WITH SAME

Alain Benichou, Pontailler sur Saone, and Max Siguier, Aix en Provence, both of France, assignors to Societe Anonyme D'Explosifs et de Produits Chimiques & Max Siguier, Paris, France

Filed Sep. 2, 1983, Ser. No. 528,958

Claims priority, application France, Sep. 2, 1982, 82 15019

Int. Cl.³ D02G *3/04, 3/18, 3/40*

U.S. Cl. 57—250 **9 Claims**

1. A string for a tennis racket having a composite cross-section structure having a central reinforcing core comprising twisted Kevlar aromatic polyamide and glass yarns in which the Kevlar/glass yarns are present in a weight ratio of between about 1/1 and 3/1; said core layer having a peripheral protective coating of a polyamide.

4,530,207

POWER PLANT WITH A FLUIDIZED BED COMBUSTION CHAMBER

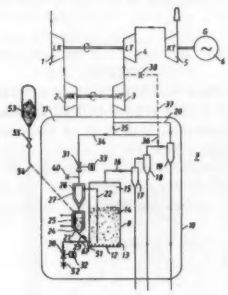
Roine Brännström, Finspong, Sweden, assignor to ASEA-STAL AB, Sweden

Filed Apr. 20, 1984, Ser. No. 602,579

Claims priority, application Sweden, May 5, 1983, 8302572; Aug. 23, 1983, 8304558

Int. Cl.³ F02C *3/26*

U.S. Cl. 60—39.464 **19 Claims**



1. A power plant with a combustion chamber with a fluidized bed for combustion of fuel supplied to the bed and with means for adjusting the bed height by transferring bed material from the combustion chamber to a storage container and returning bed material from the storage container to the combustion chamber in which the storage container for bed material is connected to the combustion chamber by means of feed-out and return conduits in which the storage container is connected, via a conduit with a valve, to a space having a lower pressure than that in the combustion chamber, and in which the return conduit is connected, via a conduit with a valve, to a pressure gas source having a higher pressure than the pressure in the combustion chamber.

4,530,208

FLUID CIRCULATING SYSTEM

Shigeki Sato, 72 kanta shimoayash Miyagi-cho, Miyagi, Miyagi, Japan

Filed Mar. 8, 1983, Ser. No. 473,284

Int. Cl.³ F03G *7/06*

U.S. Cl. 60—516 **20 Claims**

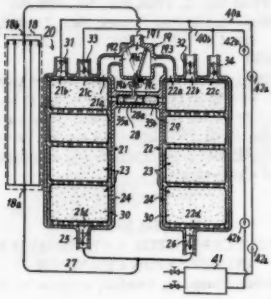
1. A fluid circulating system comprising:

(a) a source of a first fluid, serving as a heat transfer medium;

(b) first and second closed vessels for containing a second fluid, serving as a working fluid, and having an inlet and an outlet for the working fluid;

(c) expansion means, contained wholly within each of said vessels, for expansion responsive to a temperature increase to displace working fluid from the vessel and contraction responsive to a temperature decrease to draw working fluid into the vessel;

(d) supply means for alternately supplying said first fluid to



said first vessel or to said second vessel, said supply means including a changeover valve for switching the supply of first fluid from one of said vessels to another of said vessels, and a

(e) working fluid circulation loop, connected at one end to both of said inlets and at the other end to both of said outlets.

4,530,209

CONTROL ARRANGEMENT FOR A VEHICULAR BRAKE SYSTEM WITH HYDRAULIC BRAKE BOOSTER

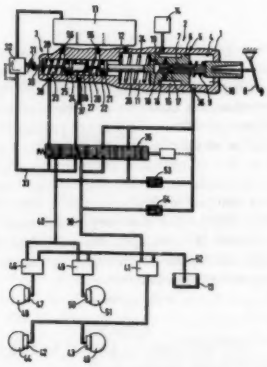
Helmut Steffes, Eschborn, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 295,038, Aug. 21, 1981, abandoned. This application May 14, 1984, Ser. No. 609,532

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1980, 3037460

Int. Cl.³ B60T *13/00*

U.S. Cl. 60—547.1 **9 Claims**



1. In a vehicular braking system employing hydraulic brake booster action, apparatus for controlling the admission of hydraulic fluid from a combined structure including a brake booster and master cylinder to respective wheel brake actuating cylinders of the system, and for controlling the admission of fluid from an auxiliary pressure source to said wheel cylinders, said system comprising a reservoir for maintaining hydraulic fluid at ambient pressure and an auxiliary pressure source of fluid at pressures above the ambient pressure, at least one switching valve in the path of fluid from said combined structure to said wheel cylinders, said switching valve operable between a first position in which there is communication between the master cylinder and the wheel cylinders for fluid from said reservoir and from the booster for fluid from said auxiliary source to said wheel cylinders and a second position in which there is return communication from said master cylinder to said reservoir and communication from said brake booster to said wheel cylinders for fluid from said auxiliary source, said switching valve responsive to pressure of fluid from said auxiliary source exceeding a predetermined level above the ambient pressure level for operating from said first position to said second position, and a pressure limiting valve in a line of communication from said master cylinder to said reservoir with the switching valve in its second position, said limiting valve being dependent on the operation of a brake pedal for limiting the pressure of fluid in said master cylinder with said switching valve in the second position.

4,530,210

APPARATUS FOR CONTROLLING EVAPORATED FUEL IN AN INTERNAL COMBUSTION ENGINE HAVING A SUPERCHARGER

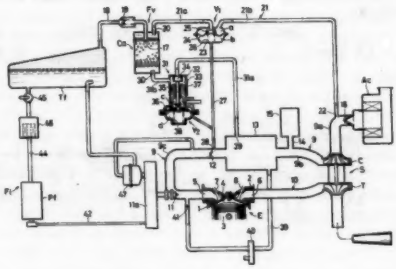
Ryutarou Yamazaki, Tokyo, Japan, assignor to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Dec. 17, 1982, Ser. No. 450,609

Claims priority, application Japan, Dec. 25, 1981, 56-211463

Int. Cl.³ F02B *37/00*; F02M *25/08*

U.S. Cl. 60—605 **6 Claims**



1. An internal combustion engine comprising:

a supercharger including a compressor to compress air in an intake passage leading to a combustion chamber of said engine, a canister connected to a source of evaporated fuel;

a throttle valve in said intake passage downstream of said compressor;

a fuel pipeline extending from said canister to said intake passage upstream of said compressor to transfer said evaporated fuel from said canister to said intake passage;

an air pipeline extending from said intake passage between said compressor and said throttle valve and downstream of said compressor to said canister to transmit a positive pressure from said intake passage to said canister;

a reed valve provided in said intake passage upstream of said fuel pipeline;

a first pressure control valve provided in said fuel pipeline, and connected in fluid communication to said intake passage in the vicinity of said throttle valve to open under the action of a negative pressure existing when said throttle valve is opened to a greater degree than in an idling position, whereby fuel may be delivered through said fuel pipeline; and

a second pressure control valve provided in said air pipeline, and connected in fluid communication to said intake pas-

sage in the vicinity of said throttle valve to open under the action of said negative pressure to allow said positive pressure to be transmitted from said intake passage to said canister.

4,530,211

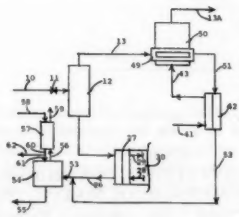
SYSTEM FOR PRODUCING STEAM AND MECHANICAL ENERGY FROM A HYDROTHERMAL FLOW

Jerome S. Spevack, 160 W. Pinebrook Dr., New Rochelle, N.Y. 10804

Division of Ser. No. 428,651, Sep. 30, 1982, Pat. No. 4,489,561. This application Jul. 30, 1984, Ser. No. 635,670

Int. Cl.³ F03G *7/04*

U.S. Cl. 60—641.5 **20 Claims**



1. A process for producing power with a steam driven prime mover from a two-phase steam and liquid water flow from a hydrothermal source, which comprises:

(a) separating said two-phase flow, at a pressure greater than the desired inlet pressure of said prime mover, into a steam flow and a raw hot water flow;

(b) passing said raw steam through the heat exchanger of a boiler containing a first supply of boiler water for condensing said raw steam and transferring the thermal energy thereof to the vaporizing of said boiler water to produce clean steam at at least said inlet pressure of said prime mover;

(c) delivering said clean steam to said prime mover inlet;

(d) passing said hot water from step (a) through a heat conversion means for extracting sensible heat from said hot water flow and producing, from a portion of said extracted heat and a second supply of boiler water, a flow of auxiliary steam at least at said prime mover inlet pressure;

(e) delivering said flow of auxiliary steam from step (d) to said prime mover inlet; and

(f) producing mechanical power by expanding in said prime mover said flow of clean steam delivered in step (c) and said flow of auxiliary steam delivered in step (e), and condensing expanded steam discharged from said prime mover.

4,530,212

TURBINE CONDENSER WITH AT LEAST ONE BYPASS STEAM INLET LEADING INTO THE STEAM DOME

Otto Von Schwerdtner; Hans Gossen, both of Mulheim; Jürgen Günther, Wesel, and Hans Peters, Mulheim, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim, Fed. Rep. of Germany

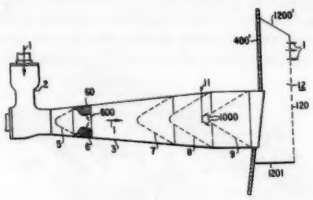
Filed Oct. 31, 1983, Ser. No. 547,245

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1982, 3240453

Int. Cl.³ F01K *19/00*

U.S. Cl. 60—657 **12 Claims**

1. In a turbine condenser, the improvement comprising a steam dome of the condenser having a wall, at least one bypass steam inlet discharging into said steam dome, said bypass steam inlet including a bypass valve for controlling the amount of bypass steam in said bypass steam inlet, at least two series-connected throttling devices disposed downstream of said bypass valve for decompressing the bypass steam, each respective throttling device disposed relatively further downstream having a larger cross setion than each throttling device disposed relatively further upstream, said throttling device disposed farthest downstream being in the form of an insert with a convex curvature and a multiplicity of holes formed therein disposed in said steam dome conforming to the contour of said



steam doem wall, and a device for injecting water into said bypass steam inlet cooling the bypass steam, said insert being in the form of a substantially verical multi-hole semicylinder being cut parallel to the axis of the bypass steam inlet and having outer walls including an upper wall upwardly inclined toward said steam dome wall.

4,530,213

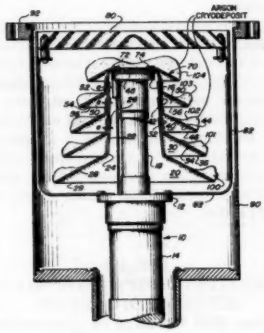
ECONOMICAL AND THERMALLY EFFICIENT CRYOPUMP PANEL AND PANEL ARRAY

Frank J. Kadi, New Tripoli, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 28, 1983, Ser. No. 508,408

Int. Cl.³ B01D *8/00*

U.S. Cl. 62—55.5 **9 Claims**



1. In a cryopump of the type having an elongated refrigeration source adapted to mount and cool a cryopanel, the improvement comprising:

a plurality of cryopanels of each being a surface of revolution having a tapered bayonet interface portion being of generally cylindrical shape, the walls of the cylinder tapering slightly from a first end of said interface portion to a second end of said interface portion and a major pumping surface portion being a continuation of said interface portion and being in the shape of a truncated cone with a relatively flat angle between the base and the wall of said cone;

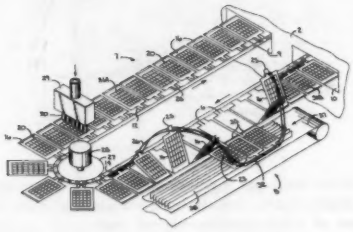
said cryopanels fabricated with differing diameters for the base of said pumping surface whereby the plurality of cryopanels are fixed by suitable means to said refrigeration source in a vertical array with the smaller diameter panel first and the larger diameter panel last installed beginning at the coolest end of said refrigeration source.

4,530,214

MANUFACTURE OF MOLDED FROZEN CONFECTIONS

Carroll V. Ellsworth, Hagerstown, Md.; Fredrick W. Schultz, and Harold J. Vastag, both of Green Bay, Wis., assignors to Gold Bond Ice Cream, Inc., Green Bay, Wis.

Filed Apr. 4, 1984, Ser. No. 597,240
Int. Cl.³ A23G *9/00*
U.S. Cl. 62—71 **13 Claims**



1. In a confection freezing machine having a soft confection filling station, a freezing chamber and a hard frozen confection discharge station, and having a conveyor, said conveyor including a plurality of generally horizontal confection support plates disposed successively therealong, the improvement comprising:

(a) mold elements pivotally attached to said support plates to form foldable assemblies and with said mold elements having confection molding cavities therein,

(b) said mold elements having normal positions disposed above said plates when said assemblies are folded and wherein the mouths of said cavities face upwardly for filling with soft unmolded confection material at said filling station,

(c) means for driving said conveyor and said assemblies with normally positioned filled mold elements from said filling station and through said chamber to said discharge station to thereby firmly mold and hard freeze said confection material in said mold cavities,

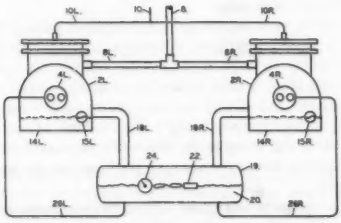
(d) and means disposed adjacent said discharge station for pivotally unfolding said assemblies to invert said mold elements so that the latter are positioned with the mouths of said cavities facing downwardly for subsequent discharge of said molded and frozen confection material from said cavities.

4,530,215

REFRIGERATION COMPRESSOR WITH PUMP ACTUATED OIL RETURN

Daniel E. Kramer, 2009 Woodland Dr., Yardley, Pa. 19067

Filed Aug. 16, 1983, Ser. No. 523,616
Int. Cl.³ F25B *43/02*
U.S. Cl. 62—84 **23 Claims**



1. An improved oil supply system for a refrigeration compressor, said compressor constituting means for causing motion in a high pressure gas stream leaving the compressor and a low pressure gas stream entering the compressor, said compressor having an oil sump; wherein the improvement comprises

a. an oil reservoir having an oil zone and a vapor zone, said reservoir being positioned to receive gravity flow from the sump;

b. oil separator means for separating oil from a gas stream;

c. means for returning oil from the separator means to the reservoir;

d. flow means connecting a point in the reservoir oil zone and a point in the compressor;

e. pump means positioned in said flow means for conveying oil from the reservoir to the compressor; and

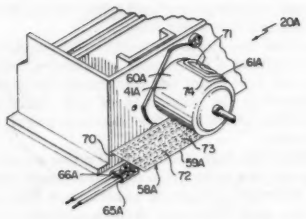
f. overflow conduit means for conveying excess oil from said sump to said reservoir.

4,530,216

REFRIGERATION SYSTEM, CONTROL DEVICE THEREFOR AND METHODS OF MAKING THE SAME

Roger P. Sepso, Stratford, Conn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed May 11, 1983, Ser. No. 493,668
Int. Cl.³ H05B *3/34*
U.S. Cl. 62—89 **1 Claim**



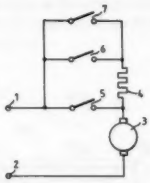
1. In a method of making a control device for a refrigerator system having a frozen food compartment and a fresh food compartment, said method comprising the steps of forming the housing means of said control device with a passage adapted to operatively interconnect said compartments together, forming said housing means to have a movable damper valve member controlling said passage, forming said housing means to have a temperature responsive unit operatively interconnected to said valve member to move said valve member between open and closed positions thereof in relation to temperature sensed by said unit, forming said temperature responsive unit to comprise a bellows construction, and forming said housing means to have a substantially cylindrical casing surrounding said bellows construction, the improvement comprising the steps of forming an electrical heater means to be carried by said housing means adjacent said temperature responsive unit to cause said temperature responsive unit to open said passage when said electrical heater means has been energized for a certain period of time, forming said electrical heater means to include a conductive sleeve telescopically disposed onto said cylindrical casing, forming said electrical heater means to include a heater wire means carried by said sleeve, forming said conductive sleeve to comprise a metal foil tape-like member, securing one side of said foil tape-like member to said cylindrical casing with adhesive means, and securing said heater wire means to the other side of said foil tape-like member with adhesive means.

4,530,217

DEFROSTING DEVICE FOR A REFRIGERATOR

Luigi Alluto, and Fabio Fancelli, both of Moncalieri, Italy, assignors to Indesit Industrial Elettrodomestici Italiana S.p.A., Turin, Italy

Filed Apr. 19, 1983, Ser. No. 486,369
Claims priority, application Italy, Apr. 20, 1982, 67519 A/82
Int. Cl.[3] F25D *21/06*; G05D *23/19*
U.S. Cl. 62—156 42 Claims



1. Defrosting device for a refrigerator comprising a number of cooling compartments, of which at least one is used for storing fresh food and at least a second for storing frozen food, at least a first evaporator assigned to the fresh food compartment and at least a second evaporator assigned to the freezer, both with refrigerating fluid flowing through them in a series circuit, a compressor for compressing the refrigerating fluid, a condenser for condensing the refrigerating fluid from the compressor, a capillary tube for supplying the refrigerating fluid from the condenser to the second evaporator, a tube for supplying the refrigerating fluid from the second evaporator to the first evaporator, a return pipe connecting the outlet of the first evaporator to the inlet on the compressor, and control means for stopping the compressor when the temperature of the first evaporator is lower than a first threshold, whereby the defrosting device provide for;

heating means that are not used for removing frost during the greater part of the time when the compressor is off; and

means for enabling said heating means to supply the first evaporator with a predetermined amount of heat, as a consequence that the temperature of one of said first and second evaporators, during the time the compressor is off, has respectively exceeded a second temperature threshold having a value lower than 0° C., or a third temperature threshold having a value around 19° C. heating; means being enabled, during the time the compressor is off, at least during one out of "n" on-off cycles of the compressor working.

4,530,218

REFRIGERATION APPARATUS DEFROST CONTROL

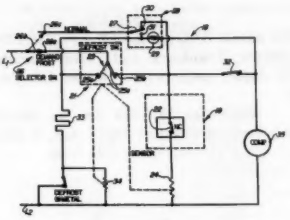
Donald E. Janke, Benton Township, Berrien County, and William J. Linstromberg, Lincoln Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Feb. 27, 1984, Ser. No. 583,483
Int. Cl.[3] F25D *21/06*
U.S. Cl. 62—156 13 Claims

1. In a refrigeration apparatus having cooling means on which frost may form during operation thereof, a defrost heater associated with the cooling means for melting such frost, an improved defrost control comprising:

thermally responsive defrost switch means in indirect heat transfer, spaced relationship with said cooling means to be alternately disposed (a) in a run position for energizing the cooling means as an incident of the temperature to which the defrost switch means is subjected being above a preselected temperature greater than the temperature of the cooling means during running thereof, or (b) in a defrost position for energizing the defrost heater;

switch control means including thermoresponsive switch means in direct thermal transfer association with said cooling means and heating means in substantially direct thermal transfer association with said defrost switch means for effectively maintaining said defrost switch means in the run position in the absence of a preselected amount of frost buildup on the cooling means sensed by said switch control means, said defrost switch means being further controlled by said heating means of the switch control means to be transferred to said defrost position as an incident of said switch control means sensing a preselected buildup of frost on the cooling means; and



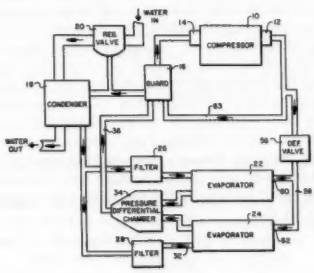
thermoresponsive defrost termination switch means in substantially direct heat transfer association with said cooling means for selectively (a) permitting energization of the defrost heater when said defrost switch means is in the defrost position or (b) preventing further energization of the defrost heater and causing the heating means of said switch control means to cause said defrost switch means to return to the run position as an incident of melting of the built-up frost from the cooling means by the energization of the defrost heater.

4,530,219

SELF-REGULATED ENERGY SAVING REFRIGERATION CIRCUIT

Jerry Aleksandrow, 415 Crescent, Lombard, Ill. 60148

Filed Jan. 30, 1984, Ser. No. 575,005
Int. Cl.[3] F25B *43/00*
U.S. Cl. 62—503 5 Claims



1. An improved refrigeration circuit of the type having a compressor with an output coupled to the inlet of a condenser which in turn has an outlet coupled to the inlet of at least one evaporator, the outlet of which is coupled to the inlet of said compressor and wherein said improvement comprises

a compressor/condenser guard device having an outer housing, a turbulence chamber disposed within said outer housing, said turbulence chamber being closed at the upper end thereof and having a plurality of outlet orifices in communication with said outer housing at the lower end thereof, a first inlet coupled to said evaporator outlet and in communication with and extending into said turbu-

lence chamber, a first outlet coupled to said compressor inlet and in communication with said outer housing to form a first refrigerant path, a heat exchanging coil within said outer housing having an inlet coupled to said compressor outlet and an outlet coupled to said condenser inlet to form a second refrigerant path in a heat exchanging relationship with said first refrigerant path.

whereby compressed refrigerant from said compressor is pre-cooled before being applied to said condenser inlet and any liquid refrigerant from said evaporator is re-vaporized before being applied to said compressor inlet.

4,530,220

DEFORMABLE BAG FOR USE AS COOLING MEDIUM

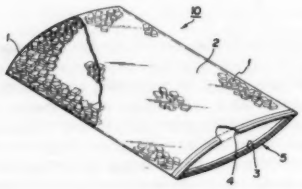
Masao Nambu, Yokohama, and Tatsuo Kinoshita, Chigasaki, both of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1984, Ser. No. 594,376

Claims priority, application Japan, Apr. 4, 1983, 58-48981[U]

Int. Cl.³ F25D *3/08*

U.S. Cl. 62—530 **17 Claims**



1. A deformable bag for use as a cooling medium which comprises:

(a) A flexible envelope, and

(b) A plurality of small pieces of a polyvinyl alcohol gel having a high water content packed within said envelope, said gel having been prepared by the steps of forming an aqueous solution or suspension of a mixture of a water-soluble organic compound and a polyvinyl alcohol having a degree of hydrolysis of not less than 95 mol % and an average polymerization degree of not less than 1,100, the concentration of said organic compound in said mixture being adjusted to be in the range of from 5 to 40 wt % and the concentration of said polyvinyl alcohol in said mixture being more than 8 wt % and not more than 25 wt %, casting said aqueous solution or suspension into a mold having the desired shape and dimensions, cooling the cast aqueous solution or suspension to a temperature of not higher than −(minus) 10° C. to solidify the same to form a molded mass of solidified gel, and then partially dehydrating, without thawing, the molded mass of solidified gel in vacuum until the percentage dehydration rate (the weight reduction rate of the solidified gel) reaches not less than 3 wt %.

4,530,221

ATTACHMENT ADAPTED FOR USE WITH DIFFERENT NECKLACES

Joshua Weinberg, 157 NE. 166 St., North Miami Beach, Fla. 33162

Continuation-in-part of Ser. No. 472,633, Mar. 7, 1983, abandoned. This application Sep. 9, 1983, Ser. No. 530,706

Int. Cl.³ A44C *25/00*

U.S. Cl. 63—2 **7 Claims**

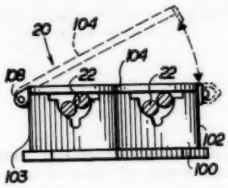
1. An attachment device of the type designed for connection to at least one portion along the length of a necklace, said attachment device comprising:

(a) a casing including two sockets disposed in contiguous relation to one another and configured to receive a length portion of a necklace therein, a cylindrical casing wall having a substantially continuous configuration substantially defining the boundaries of each socket,

(b) each of said sockets including a closed end and an open end, said open end dimensioned and configured for passage of a necklace length portion laterally therethrough,

(c) locking means movably mounted on said casing and structured for at least partial covering of said open end of each socket to retain said length portions in said sockets,

(d) passage means formed in each socket and configured and disposed for extension of a said length portion out of opposite sides of each socket,



(e) said passage means comprising two channel apertures formed in said casing wall of each socket, said two channel apertures of each socket disposed in substantially aligned relation to one another and each channel aperture comprising a predetermined configuration structured to selectively receive and hold in generally fitting relationship any one of at least two of said length portions of different cross-sectional configurations, whereby any one of a plurality of necklaces of different configurations may be closely maintained within said sockets of said attachment device.

4,530,222

CYLINDER LOCKS

Barrie S. Harper, Wednesfield, England, assignor to Chubb Lock & Safe Limited, London, England

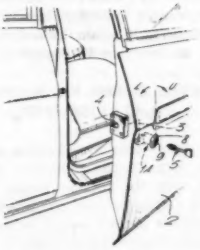
Continuation-in-part of Ser. No. 331,719, Dec. 17, 1981, Pat. No. 4,385,510, said Ser. No. 331,719, is a continuation of Ser. No. 129,805, Mar. 12, 1980, abandoned. This application May 10, 1982, Ser. No. 376,445

Claims priority, application United Kingdom, May 11, 1981, 8114348

The portion of the term of this patent subsequent to May 31, 2000, has been disclaimed.

Int. Cl.³ E05B *29/02*

U.S. Cl. 70—364 R **9 Claims**



1. In a cylinder lock in which one or more tumblers carried by a barrel of the lock act to obstruct rotation of the barrel in one, unlocking, direction only, until a key inserted into the lock engages with the one or more tumblers to displace them from providing such obstructions by initial turning of the key relative to the barrel in the said one direction from its position

of insertion, the barrel is free from obstruction to its rotation in the opposite, locking, direction from that position without such displacement of the one or more tumblers, and a spring device is operative to retain the barrel resiliently in the key-insertion position, the improvement wherein all tumblers of the lock are carried by one barrel only, the spring device exerts a resilient bias on the said one barrel throughout turning of the barrel with the key in the locking direction from the position of key insertion, and the resilient bias urges the said one barrel to return positively to the key-insertion position with the returning key from that direction.

4,530,223

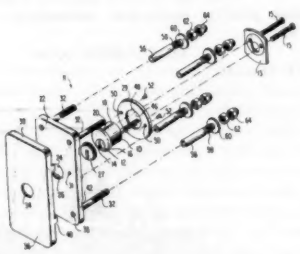
GUARD FOR KEY CYLINDER

Roy N. Oliver, Salem, Va., assignor to Medeco Security Locks, Inc., Salem, Va.

Filed Nov. 1, 1982, Ser. No. 438,373

Int. Cl.³ E05B *63/00*

U.S. Cl. 70—417 **12 Claims**



1. An assembly for protecting a rim key cylinder fitted in a door, the assembly comprising:

(a) a flat thick steel protective plate having a hole therethrough for access by a key to a cylinder lock,

(b) a plurality of cylindrical recesses in the inside surface of the protective plate around the hole,

(c) a plurality of studs welded to the protective plate and extending therefrom on the same side as the recesses,

(d) a thin replaceable cover plate fitting over the outside and side surfaces of the protective plate, and having a hole therein in registry with the hole in the protective plate,

(e) a hardened steel cylinder plug protector adapted to be rotatably positioned in a deepest of the cylindrical recesses and having a key accommodating slot therein,

(f) a cylinder retaining plate adapted to be positioned in the shallowest of the cylindrical recesses and having means for cooperating with a lock cylinder to prevent relative rotation,

(g) means for securing the cylinder retaining plate to the protective plate in the shallowest of the cylindrical recesses,

(h) hardened steel sleeves, one for each stud, adapted to be positioned over each stud, and

(i) means for cooperating with the free ends of the studs for attaching the assembly to the door.

4,530,224

STRIP-GUIDE ASSEMBLY FOR A METAL STRIP COILER

Berthold Hild, Burbach-Walbach; Martin Braun, Kreuztal-Fernsdorf, and Max Münker, Hilchenbach, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag AG, Düsseldorf, Fed. Rep. of Germany

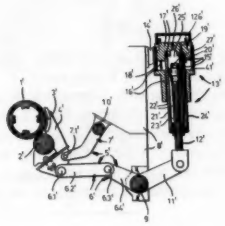
Continuation-in-part of Ser. No. 283,004, Jul. 13, 1981, Pat. No. 4,404,831. This application Sep. 19, 1983, Ser. No. 533,609

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1980, 3026524; Mar. 5, 1983, 3307840

The portion of the term of this patent subsequent to Sep. 20, 2000, has been disclaimed.

Int. Cl.³ B21C *47/06*

U.S. Cl. 72—15 **14 Claims**



1. A positioning device for a strip-guide member, in combination with a strip-coiling mandrel, of a strip coiler, said device comprising:

a linkage carrying said member and displaceable to shift said member toward and away from said mandrel; and

an elongated pneumatic-hydraulic unit connected to said linkage, said unit comprising

pneumatic cylinder means including a pneumatic cylinder having a working chamber and a pneumatic piston,

means forming a hydraulic cylinder carried by said pneumatic piston and having a hydraulic piston connected to said linkage for displacing same,

means for independently hydraulically pressurizing said hydraulic cylinder and pneumatically pressurizing said pneumatic cylinder, and

means for supporting said unit at an upper end thereof, said pneumatic piston being tubular and enclosing said hydraulic cylinder, said hydraulic piston extending downwardly out of said tubular piston.

4,530,225

BENDING SKELP OR STRIP INTO SPLIT TUBES OR PIPES

Hans Meurer, Monchen-Gladbach, and Josef Jordans, Korschenbroich, both of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 19, 1980, Ser. No. 122,697

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1979, 2906692

Int. Cl.³ B21D *39/02*

U.S. Cl. 72—52 **11 Claims**

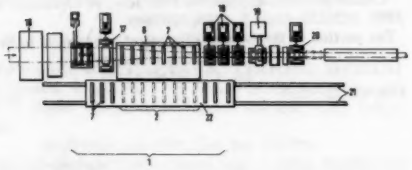
1. A method of making split tubes of different diameters by stepwise bending different width metal strip or skelp towards and around a longitudinal axis, comprising the steps of:

providing a placeable plurality n of bending stages, each causing a particular reduction in radius of curvature of the strip or skelp, most of the stages provided for bending a relatively wide strip or skelp;

selecting from said plurality n a first group of n stages, without modifying the stages of the group as so selected, for use of stepwise bending a first strip or skelp of a particular weidth;

feeding the first strip or skelp through the first group of stages to obtain a split tube;

selecting from said plurality a second group of also altogether m stages which includes some of the stages as selected for the first group, and without modifying the stages to be used in common, for use of stepwise bending a second strip or skelp of another particular width;



feeding the second strip or skelp through the second group of stages to obtain a split tube;

whereby the first strip is bent first by a first stage of the first group which is different from a first stage of the second group that first bends the second strip; and

whereby said plurality of bending stages include as many possible last stages for completing a split tubes as there are different diameters for tubes to be accommodated.

4,530,226

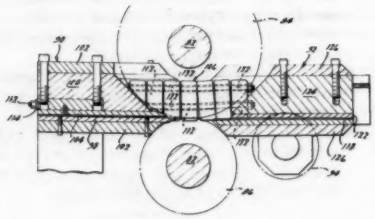
SWEEP-FORMING APPARATUS

Carl F. Granzow, Royal Oak; Edward G. Lash, Huntington Woods; Everett Gleason, South Lyon, and Jerome Kubiak, Troy, all of Mich., assignors to Tishken Products, Inc., Oak Park, Mich.

Filed Jun. 13, 1983, Ser. No. 503,405

Int. Cl.³ B21D *7/08*

U.S. Cl. 72—171 **11 Claims**



1. An apparatus for introducing a sweep into an elongated article having a predetermined cross-sectional shape and defining an interior surface and an exterior surface comprising:

first and second pinch roll driving means in rolling engagement with said article for driving said article in a longitudinal direction;

roll-forming means disposed longitudinally subsequent to said first and second pinch roll driving means for introducing a sweep into said elongated article;

constraining means for preventing change in said predetermined cross-sectional shape including,

(a) an entrance guide means fixed relative to said first and second driving means and disposed longitudinally precedent to said first and second driving means, said entrance guide means having means for slidingly supporting substantially the entire exterior surface of said article as it enters engagement with said driving means;

(b) an exit guide means fixed relative to said first and second driving means and disposed longitudinally subsequent to said first and second driving means and disposed both longitudinally precedent and subsequent to said roll-forming means, said exit guide means having means for slidingly supporting substantially the entire exterior surface of said article as it exits from engagement with said driving means;

(c) internal supporting means comprising at least two elongated and parallel snake arbor means extending longitudinally between said entrance guide means and said exit guide means and disposed on axially opposite sides of said first pinch roll driving means, said internal supporting means slidingly supporting substantially the entire interior surface of said article as it enters engagement with said driving means and as it exits engagement with said driving means; and

(d) means disposed generally between said entrance and exit guide means for supporting said exterior surface of said article as it passes between said entrance and exit guide means.

4,530,227

HYDROSTATIC SUPPORT MEMBER, PARTICULARLY FOR ROLLING MILLS, AND METHOD OF USING THE SAME

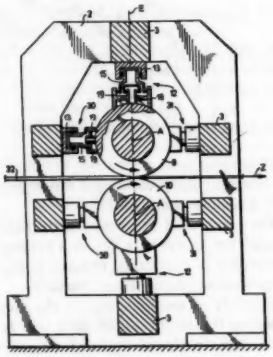
Beat Schlatter, Mutschellen, and Eugen Schnyder, Ottenbach, both of Switzerland, assignors to Sulzer-Escher Wyss Limited, Zurich, Switzerland

Filed Jul. 18, 1983, Ser. No. 514,978

Claims priority, application Switzerland, Jul. 30, 1982, 4619/82

Int. Cl.³ B21B *13/14*

U.S. Cl. 72—241 **18 Claims**



9. A hydrostatic support member comprising:

means defining a pressure chamber capable of being supplied with a pressurized fluid medium;

at least two bearing shoes displaceable relative to each other;

each said bearing shoe comprising a bearing surface provided with at least one pressure pocket;

at least one respective throttling bore for connecting each said pressure pocket with said pressure chamber;

said means defining a pressure chamber comprises a cylinder defining a cylinder axis;

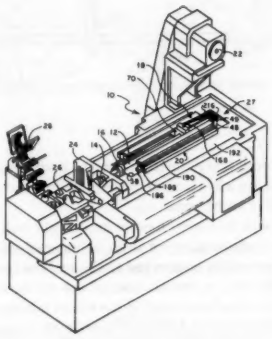
a piston carrying said at least two bearing shoes at an end thereof remote from said cylinder; and

said piston being arranged to be movable in said cylinder in the direction of said cylinder axis and being structured to permit throughflow of said pressurized fluid medium.

4,530,228
APPARATUS FOR PRODUCING SEAMLESS CONTAINER BODIES

Walter W Snyder, Burleson, Tex., and Dennis G. Dettmer, Naperville, Ill., assignors to National Can Corporation, Chicago, Ill.

Filed Mar. 21, 1983, Ser. No. 477,372
Int. Cl.³ B21D *22/28*
U.S. Cl. 72—349 8 Claims

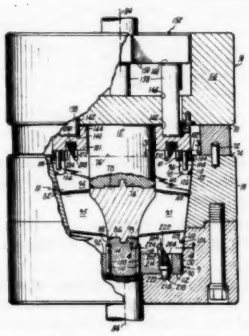


1. A container body maker for reforming cup means into elongated container body means, said bodymaker having a frame means including a slideway means, an axially extending ram means movable along said slide-way means, said ram means having a forward end and a rearward end and being movable in operation between a forward position and a rearward position, at least two guide means connected with said frame means for supporting and aligning said ram means, drive means for moving said ram means reciprocally and axially along said slideway between said forward and reaward positions, tooling means associated with said frame means forward of said guide means and in an operable relationship to and in axial alignment with said ram means, said forward end of said ram means being a predetermined space from said tooling means when said ram means is at its rearward positon, an infeed means for feeding said cup means into said predetermined space between said tooling means and said forward end of said ram means whereby said cup means will be pushed by said forward end of said ram means during said forward stroke of said ram means, said ram means being adapted to force said cup means into and through said tooling means to reform said cup means into an elongated container body means, means for removing said container body from said ram; a liquid bearing slide block assembly means having a first portion and a second portion, said first portion portion being rigidly connected to said rearward end of said ram means, said slide block assembly means being axially movable along said slideway means and being restrained against lateral movement relative to said slideway means in all directions other than in the direction of axial movement whereby lateral movement of said slide block assembly means is minimized and movement of said slide block assembly means is effectively confined to axial movement along said slideway means, said combination of said guide means, slide block assembly means and said rigid connection of said ram thereto providing stable support and accurate alignment of said ram means with said tooling means.

4,530,229
FORGING METHOD AND DIE PACKAGE THEREFOR

Bryant H. Walker, Stuart, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 26, 1983, Ser. No. 498,233
Int. Cl.³ B21D *22/00*
U.S. Cl. 72—354 11 Claims



1. In a process for forging a component comprising a central disc structure having a plurality of integrally formed appendages extending radially outwardly therefrom, the steps of

(1) assembling a die package having an axis, comprising the steps of

(a) disposing about said axis a cylindrical array of adjacent die segments having side walls contoured to the inverse geometry of the appendages to be formed, the array of segments defining a central cavity, said segments each having an upper surface, said upper surface of each segment having an axially extending, cylindrical, first locating hole therein,

(b) disposing a rigid support member over said first locating holes, said support member having a plurality of axially extending, cylindrical, second locating holes therein, a second locating hole corresponding to each one of said first locating holes, said first locating holes being located and arranged with respect to each other such that when said first locating holes are simultaneously aligned with said corresponding second locating holes said die segments are accurately positioned relative to each other, and

(c) inserting a rod into each second locating hole and inserting one end of each of said rods into a corresponding first locating hole, said rods fitting tightly within both said first and second locating holes to position said segments accurately relative to each other;

(2)disposing said die package within a forging press and placing a billet of material, from which the component is to be formed, within the central cavity of the die package defined by the cylindrical array of die segments;

(3) raising the temperature of the billet and die package to the temperature at which the component is to be forged;

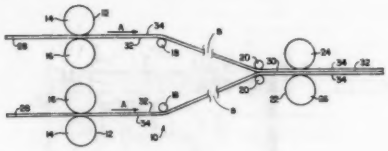
(4) pressing the billet at forging temperatures in the direction of the axis of the die package between axially spaced apart disk forming dies to force the billet material into the appendage forming cavities defined between adjacent die segments of the die package to form the component; and

(5) releasing the forged component from the die package including the step of shearing the rods by moving the die segments radially outwardly relative to the axis of the die package.

4,530,230
FOIL ROLLING METHOD AND APPARATUS

Frank E. Monks, Bettendorf, Iowa, assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Nov. 14, 1983, Ser. No. 551,183
Int. Cl.[3] B21D *31/00*
U.S. Cl. 72—363 9 Claims



3. In a foil rolling process for producing thin gauge metal foil, the method of producing a pair of pack rolled foil webs comprising the steps of:

providing a pair of metal webs;

rolling each of said metal webs between a first pair of work rolls

to produce on opposite sides of each of said webs a relatively brighter surface finish and a relatively grayer surface finish;

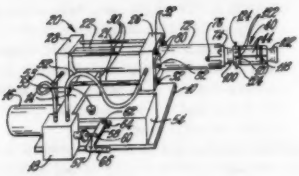
mating said pair of webs with the respective brighter surface finish sides thereof together to form a pack; and

rolling said pack between a second pair of work rolls which contact the respective relatively grayer sides of said webs.

4,530,231
METHOD AND APPARATUS FOR EXPANDING TUBULAR MEMBERS

Perry A. Main, Erie, Mich., assignor to APX Group Inc., Toledo, Ohio

Filed Jul. 3, 1980, Ser. No. 165,731
Int. Cl.[3] B21D *41/02*
U.S. Cl. 72—393 10 Claims

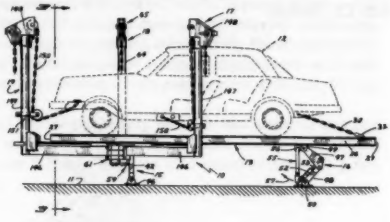


1. Apparatus for expanding metal tubing including an assemblage of expandable members, power means for actuating the expandable members including a power-actuated movable shaft, indexing means for determining the amount of outward movement of the expandable members, said indexing means including a relatively stationary element and an adjustable selector element, one of said elements having a plurality of indexing slots of varying depths, the other of said elements having abutment means arranged for cooperation with the indexing slots, a pair of cone-shaped members, one of said cone-shaped members associated with the selector, the other of said cone-shaped members being connected with the power-actuated movable shaft whereby the power-actuated shaft exerts pressure on said cones to effect expansion of the expandable members to expand tubing in engagement with the assemblage of expandable members.

4,530,232
FRAME AND BODY REPAIR APPARATUS

John W. Smith, Kimball, Minn., assignor to Systems International, Inc., Hutchinson, Minn.

Filed Mar. 16, 1984, Ser. No. 590,519
Int. Cl.[3] B21D *1/12*
U.S. Cl. 72—447 22 Claims



1. A vehicle body repair apparatus comprising:

a bed having a horizontally orientated portion for support of a vehicle to be repaired;

a pull tower assembly having an upright pull tower column and a horizontal pivot arm, a first end of the pivot arm being pivotally connected to the bed for rotation about an upright axis, a second end of the pivot arm being connected to the lower end of the tower column for rotational movement of the tower column with respect to the bed;

pivot means pivotally assembling the first end of the pivot arm to the bed;

means for securing a vehicle to the bed;

a power head assembled to the upper end of the tower column, said power head having a frame, a stationary pulley means assembled to the power head frame, a movable pulley means assembled to the power head frame, guide means on the power head frame for guiding the movable pulley means in a horizontal path between first and second positions with respect to the stationary pulley means;

a tension line having a first end releasably fixed with respect to the power head frame, said tension line being trained over the first and second pulley means and having a second end fixable relative to a vehicle to be repaired;

power means for the horizontal movement of the movable pulley means toward a position with respect to the stationary pulley means to exert a pull force on the tension line between the first and second pulley means when the second end of the tension line is fixed.

4,530,233
METHOD AND APPARATUS FOR DISTINGUISHING BETWEEN DIFFERENT GAS OR GAS MIXTURES USING A FLOW TUBE

Frank J. Kadi, New Tripoli, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 18, 1983, Ser. No. 515,092
Int. Cl.[3] G01N *7/00*
U.S. Cl. 73—23 8 Claims

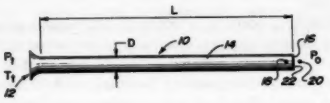
1. An apparatus for distinguishing between different gases or gas mixtures flowing ad seriatum through a tube comprising in combination:

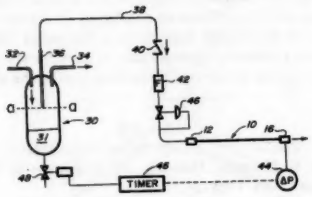
a flow tube having an inlet section and an outlet section said tube being so constructed and arranged that a first or control gas flowing through the tube will establish a shock wave of a given magnitude at the exit of the tube;

means for introducing gas to the inlet of said flow tube; and

means for measuring the pressure differential across the exit of said flow tube; whereby when said first or control gas

flows through said tube said exit pressure differential is near zero and when the second or other gas or gas mixture





flows through said tube said pressure differential is significantly higher than measured with said first or control gas.

4,530,234

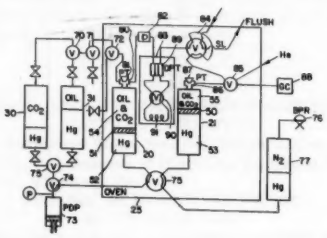
METHOD AND SYSTEM FOR MEASURING PROPERTIES OF FLUIDS

Alvin S. Cullick, and Bert J. Warner, both of Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,759

Int. Cl.³ G01N *11/00*

U.S. Cl. 73—53 **16 Claims**



1. A system for measuring properties of fluids comprising:

a pair of high pressure cells, each one of said cells including a floating piston therein separating each of said cells into a fluid analysis chamber and a hydraulic fluid chamber,

means for selectively controlling the amount of pressure applied to said hydraulic fluid chamber of each cell whereby the pressure of the fluid in said fluid analysis chamber is defined, and

means interconnecting said fluid analysis chamber of each of said cells for passing fluid to be analyzed between each of said cells.

4,530,235

RAPID DETERMINATION OF METAL STRENGTH FROM HARDNESS TESTS

Barrie S. Shabel, Murrysville, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 24, 1983, Ser. No. 544,735

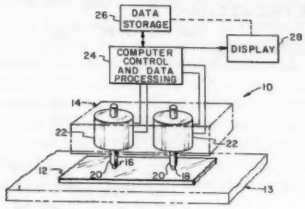
Int. Cl.³ G01N *3/42*

U.S. Cl. 73—81 **4 Claims**

1. Apparatus for rapidly determining yield and/or tensile strength of a metal material from hardness evaluations thereof, comprising:

at least two indentors for making at least two impressions in a metal material,

means mechanically connected to the respective indentors for moving the same against the material,



means for selecting a load level at which a first one of the indentors is moved against the material, and

computer means for automatically selecting a larger level of load at which the second of the two indentors is applied against the material if the impression made by the first indentor is too shallow.

4,530,236

SOIL INVESTIGATION DEVICE

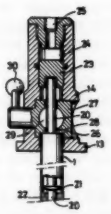
Arie P. van den Berg, Heerenveen, Netherlands, assignor to Ingenieursbureau A. P. Van den Berg B.V., Heerenveen, Netherlands

Filed Dec. 23, 1982, Ser. No. 452,789

Claims priority, application Netherlands, Dec. 24, 1981, 8105858

Int. Cl.³ G01N *3/00*

U.S. Cl. 73—84 **13 Claims**

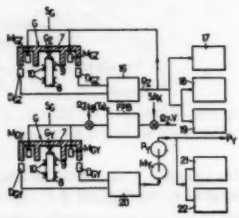


1. A device for driving a rod or tube into the soil comprising means for fixedly supporting the device with respect of the ground, means for driving a tube or rod or a string of interconnected tubes or rods substantially vertically into the soil and retracting it therefrom again, said driving means comprising a housing defining a cylinder, a hollow driving piston including a piston rod movable through a stroke within said cylinder, said piston and piston rod having a hollow bore axially therethrough such that the tubes or rods can be led through said bore, said piston rod being connected to a driving head by means of which a pressing force can be exerted on the upper end of the tube or rod being driven into the soil, said head being mounted to said housing by head coupling means including a horizontal sliding guide so as to allow said head to be shifted away laterally from the piston bore to thus expose the piston bore for insertion of a rod or tube thereinto, said head coupling means being adapted for interchangeably accepting either a pulling head or a pressing head.

4,530,237
GYROSCOPIC NAVIGATIONAL INSTALLATIONS

Jacques Barriac, Plaisir, France, assignor to Societe d'Applications Generales d'Electricite et de Mecanique Sagem, Paris, France

Continuation-in-part of Ser. No. 416,007, Sep. 8, 1982, abandoned. This application Sep. 28, 1982, Ser. No. 425,878
Claims priority, application France, Sep. 18, 1981, 81 17692; Jul. 28, 1982, 82 13189
Int. Cl.³ G01C *21/00*
U.S. Cl. 73—178 R **13 Claims**



1. A gyroscopic navigational installation mounted on a movable vehicle having a longitudinal axis and having a trajectory when moving, said gyroscopic navigational installation comprising

a gimbal supported by said vehicle for pivoting around a pivot axis, said gimbal having a rolling torquer motor and an angular rolling position detector, said position detector having a stator that is fixed on said gimbal;

a first gyro having a gyro wheel rotating around a rotational axis, said first gyro having two axes of sensitivity, said first gyro being supported by said gimbal so that one of said axes, an azimuth sensitivity axis, is orthogonal to said pivot axis, the other one of said axes, a rolling sensitivity axis, being parallel to said pivot axis, and so that said first gyro rotational axis is maintained in an horizontal plane, said first gyro being provided with azimuth position detectors, with rolling position detectors, and with an azimuth precessional torquer motor;

said azimuth position detectors of said first gyro controlling said azimuth precessional torquer motor of said first gyro and giving an indication which is used, on the one hand, to obtain an azimuth parameter representing an angular rate signal (Ω_z) characterizing the vehicle trajectory and, on the other hand, to obtain an auxiliary azimuth aiming function, and said rolling position detectors of said first gyro controlling said rolling torquer motor of said gimbal which carries said stator of said angular rolling position detector and said rolling position detector giving indications which are used to obtain an auxiliary rolling aiming function;

a controlled accelerometer having two axes of sensitivity, said controlled accelerometer being supported by said gimbal so that one of said axes, a pitching sensitivity axis, is parallel to said pivot axis and so that the other one of said axes, a rolling sensitivity axis, is parallel to said first gyro rotational axis, said controlled accelerometer being arranged for delivering first and second analogous signals, a rolling inclination signal (SA_X) and a pitching inclination signal (SA_Y), respectively, representative of the measurement of the accelerations of the vehicle along said rolling sensitivity axis and said pitching sensitivity axis;

said rolling inclination signal (SA_X) of said accelerometer (after correction of a centrifugal effect (Ω_z.V)) being used for levelling, by precession, said rotational axis of said first gyro, which causes a slow rotation of said gimbal around said rolling sensitivity axis of said first gyro;

a second gyro having at least one axis of sensitivity, a pitching sensitivity axis, said second gyro being supported by said gimbal so that said pitching sensitivity axis is horizontal and is parallel to said first gyro rotational axis, said second gyro being provided with a pitching position detector and provided with a pitching precessional torquer motor;

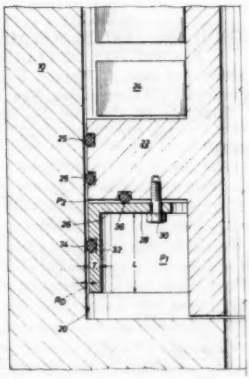
said pitching position detector of said second gyro controlling the pitching precessional torquer motor of the second gyro and giving a signal (Ω_X) which is used to obtain an auxiliary pitching aiming function, said pitching inclination signal (SA_Y) of said accelerometer being used for indicating pitching in the long term, and said second gyro being used for indicating an exact short term rate (Ω_x) which is the pitching rate;

whereby the complementarity of the spectra of said signals (SA_y) and (Ω_X) allows an analogous or digital computing loop to be formed leading to a computed value of the pitching which is substantially accurate over the whole range of the spectrum, in the long and in the short term.

4,530,238
HIGH PRESSURE SEAL ASSEMBLY

Lawrence A. Hayman, Houston, Tex., assignor to NL Industries, Inc., New York, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,485
Int. Cl.³ G01D *11/26*
U.S. Cl. 73—431 **1 Claim**



1. A seal assembly comprising: a cylindrically-shaped housing having a longitudinal passage therethrough; an insert cover mounted in said passage, said insert cover forming an interior space between said insert cover and said housing and being exposed on its exterior to a relatively high fluid pressure and on its interior to a fluid pressure less than said relatively high fluid pressure; and flange means positioned about the periphery of said insert cover, a portion of said flange means being deformable by the pressure differential between said high pressure and said low pressure to sealably mate with said housing.

4,530,239
UNIVERSAL BALANCE PLATE

Joseph V. Scarinci, 131 Shore Ct., Apt. 1, North Palm Beach, Fla. 33408

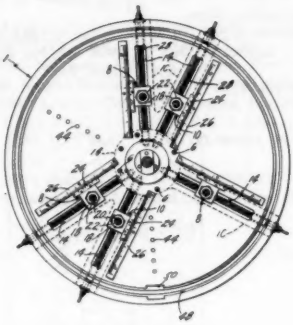
Continuation of Ser. No. 267,872, May 28, 1981, abandoned. This application Apr. 11, 1984, Ser. No. 599,235
Int. Cl.³ G01M *1/02*
U.S. Cl. 73—455 **22 Claims**

1. A plate for use with a machine for precision balancing of a jet engine rotary machinery piece said plate comprising:

aluminum disc means, said disc means having an axial hub, said disc means being rotatably secureable to a spindle of

a balancing machine, said disc means having first and second surfaces;

three locating means, said locating means being radially mounted upon said disc means second surface about said hub, said locating means being spatially separated equally from one another, said locating means being radially movable with respect to said disc means hub and extending above said disc means first surface, said locating means being retainable in a desired position, said locating means engaging and centering a rotary machinery piece on said disc means; and



two hold down means, said hold down means being radially mounted upon said disc means second surface about said hub, said hold down means being spatially separated 180° part from one another and being angularly spaced relative to said locating means, said hold down means being radially movable with respect to said disc means hub and extending above said disc means first surface, said hold down means being retainable in a desired position, said hold down means engaging and securing a centered rotary machinery piece to said disc means.

4,530,240

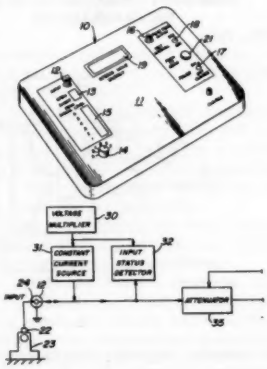
METHOD AND APPARATUS FOR DIAGNOSING MACHINE CONDITION

David B. Board, Boca Raton, Fla., and William J. Cooper, King of Prussia, Pa., assignors to Diagnostic Equipment Development, Inc., Edgemont, Pa.

Filed Nov. 15, 1983, Ser. No. 551,892

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—593 **4 Claims**



1. Apparatus for predicting failures in rotary equipment including bearings, gears and the like, said apparatus comprising: a transducing sensor for attachment to the equipment to produce electrical signals corresponding to vibration and friction and shock waves in the equipment; band pass filter means connected to the sensor for filtering out the signals corresponding to vibration and passing only signals corresponding to friction and shock waves in a frequency band around the natural frequency of said sensor; detector means connected to said filter means for detecting the envelope of signals in said frequency band; integrating means connected to said detector means for integrating the envelopes of said friction and shock signals as a measure of friction and shock wave energy; and full wave rectifier means between said band pass filter means and detector means, for maximum information utilization, said integrating means comprising voltage to frequency converter means connected to said detector means, and counter means connected to said voltage to frequency converter means.

4,530,241

METHOD OF MONITORING THE IDENTITY AND INTEGRITY OF AN OBJECT PARTICULARLY A CLOSED CONTAINER

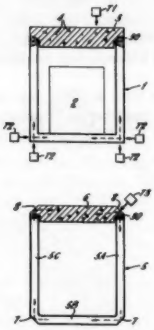
Serge Crutzen, Orino; Gian Aldo Franzetti, Besozzo, and Gian Piero Battagin, Angera, all of Italy, assignors to European Atomic Energy Community (Euratom), Luxembourg

Filed Apr. 8, 1980, Ser. No. 138,349

Claims priority, application United Kingdom, Apr. 24, 1979, 7914205

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—602 **6 Claims**



1. A closed container for containing material to be safeguarded comprising: a plurality of walls defining said closed container, at least one of said walls being a closure member, having a distinctive internal structure for identifying said container, said distinctive internal structure comprising a material matrix having embedded therein inclusions disposed in a random configuration, a transmitting means for transmitting ultrasonic signals through said distinctive internal structure to provide a signal representative of the identity of said container and for transmitting ultrasonic signals through all walls of said container to provide a signal representative of the entire wall structure of said closed container.

4,530,242

MOVABLE ULTRASONIC TRANSDUCER ARRAY

Jaswinder S. Sandhu, Chicago, Ill., assignor to Raj Technology, Inc., Chicago, Ill.

Filed Jul. 25, 1983, Ser. No. 516,542

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—625 **47 Claims**

8. A movable ultrasonic transducer array assembly for pro-

viding uniform insonification of an object to be inspected, said assembly including:

means for supporting a plurality of sending transducers in substantially parallel alignment;

a plurality of sending transducer means mounted to said support means in an array having a periphery with each of their transmission axes being substantially parallel to each other; and

means for moving said array and support along a predetermined planar closed loop path having a geometric center within said periphery in a periodic manner.

38. An ultrasonic inspection apparatus comprising:

transducer means for insonifying an object to be inspected;

a liquid crystal cell detector for receiving ultrasonic energy from said object and converting said energy into a viewable image of said object, said liquid crystal cell detector having an image decay time; and

means for moving said transducer means in a predetermined repeated path having a period less than said image decay time.

4,530,243

METHOD FOR DETERMINING THE POSITION OF A MEASURING SENSOR OR A PROBE

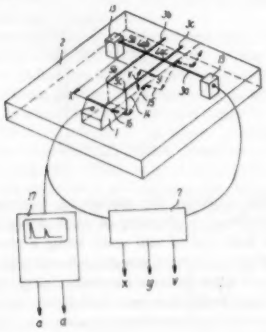
Svend A. Lund, Birkerod; Peter Krarup, Naerum, and Thorkild Kristensen, Farum, all of Denmark, assignors to Akademiet for de Tekniske Videnskaber, Svejsecentralen, Glostrup, Denmark

Filed Nov. 4, 1983, Ser. No. 548,780

Claims priority, application Denmark, Nov. 4, 1982, 4901/82

Int. Cl.³ G01N *29/00*; G05B *1/06*

U.S. Cl. 73—633 **7 Claims**



1. A method for determining the position of a measuring sensor or probe, which is freely movable over and at a constant distance from the surface of an object to be examined, such as a sound probe for ultrasonic examination of the interior of the object, comprising the steps of arranging at least one bar of an electrically conducting material in fixed relation to the object to be examined and at a certain distance from the surface thereof, arranging at least one other bar of electrically conducting material in fixed relation to the probe and in such position as to be constantly in sliding and electrical contact at a crossing point with the at least one bar when the probe is moved over the surface of the object, applying for each measuring position of the probe an electrical current to the bars, measuring the voltage drop in a current carrying bar from a reference point on that bar to the crossing point with another bar, said other bar serving as a measuring sensor for determining the voltage drop, and determining the actual position of the probe in relation to a reference system on the surface of the object to be examined by applying the measured voltage drops to an electronic calculating circuit.

4,530,244

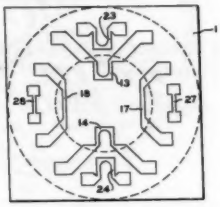
SEMICONDUCTOR PRESSURE TRANSDUCER

James B. Starr, St. Paul, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 336,995, Jan. 4, 1982, abandoned. This application Jun. 25, 1984, Ser. No. 623,632

Int. Cl.³ G01L *9/06*

U.S. Cl. 73—727 **8 Claims**



1. In a semiconductor pressure transducer comprising a single crystal semiconductor chip, wherein a circular cavity is formed in one surface of said chip; a cylindrical tube having one end thereof bonded to said one surface of said chip and surrounding said cavity; and at least one principal stress sensor disposed on the other surface of said chip opposite said cavity; the improvement comprising:

at least one auxiliary stress sensor disposed on said other surface of said chip opposite to said one end of said tube;

said principal stress sensor and said auxiliary stress sensor being connected in circuit to effectively cancel any zero shift components in the signal generated by said principal stress sensor.

4,530,245

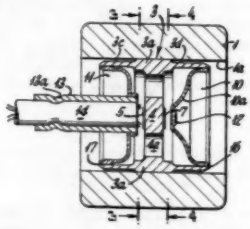
STRAIN MEASURING APPARATUS AND METHOD OF MAKING SAME

Walter E. Jacobson, Meriden, Conn., assignor to Revere Corporation of America, Wallingford, Conn.

Filed Oct. 17, 1983, Ser. No. 542,725

Int. Cl.³ G01B *7/18*

U.S. Cl. 73—768 **12 Claims**



1. Strain measuring apparatus adapted for press fitting into a hole in a member to measure strains in said member, comprising:

a. a hollow cylindrical shell having:

1. a middle portion with externally projecting knurled ridge means, the overall diameter of the shell and ridge means taken together being greater than the diameter of the hole; and
2. end portions having smaller diameters than the hole;

b. a web extending across the interior of said middle portion of the shell perpendicular to the axis thereof;

c. at least one strain gage element on the web; and

d. an end surface on the shell for the application thereto of a force sufficient to press fit the shell completely into the hole.

4,530,246

METHOD AND APPARATUS FOR IDENTIFYING FRACTURED BRITTLE ARTICLES

Kelvin G. Pitman, Newbury; David A. Grime, Preston, and Malcolm R. M. Knight, Newbury, all of England, assignors to Metal Box Public Limited Company, Reading, England

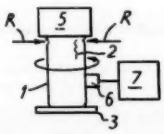
PCT No. PCT/GB82/00173, § 371 Date Feb. 7, 1983, § 102(e) Date Feb. 7, 1983, PCT Pub. No. WO82/04482, PCT Pub. Date Dec. 23, 1982

PCT Filed Jun. 10, 1982, Ser. No. 466,352

Claims priority, application United Kingdom, Jun. 16, 1981, 8118530

Int. Cl.³ G01N *22/02*

U.S. Cl. 73—799 **16 Claims**



1. A method of automatically inspecting an article of brittle material comprising the steps of:

applying a load to the article;

subjecting the article to a simple stream of liquid while the load is being applied, said stream being in free flow at a velocity such that the liquid is in laminar flow; and

detecting any resulting acoustic emission from the article with a transducer in the stream so that said emission is transmitted to the transducer by the stream.

4,530,247

TIMED GAS METEKING AND DISTRIBUTION SYSTEM

Aarne T. Haas, Portland, Oreg., assignor to Northwest Natural Gas Company, Portland, Oreg.

Filed Mar. 15, 1983, Ser. No. 475,609

Int. Cl.³ G01F *1/00*

U.S. Cl. 73—861 **19 Claims**

1. A fuel gas distribution and metering system for providing separately-metered gas utility service to units in a multi-unit structure, the system comprising:

a main gas infeed line extending into the structure;

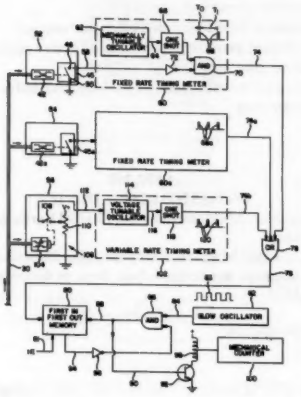
multiple branch gas lines branching from the infeed line inside the structure, each branch gas line extending into a different unit in the structure to fuel a gas-fueled appliance therein and at least some of said branch gas lines connected to a plurality of said appliances;

a plurality of meter readout means for displaying a separate readout of gas consumption for each said unit at a common location remote from the appliances;

a plurality of electrically-operable metering means each connected to a different one of said appliances and including a sensing means for sensing gas flow through the burner of the appliance and providing an electrical output signal corresponding to gas consumption by said appliance; and

an electrical signal transmission means for transmitting said electrical output signal from each of said metering means to one of said meter readout means;

the meter readout means being responsive to the electrical output signal to update the readout of gas consumption for each unit during operation of any of the gas-fueled appliance contained therein;



the sensing means including an electrical pressure switch responsive to a change in gas pressure in the appliance, upon commencing and ceasing operation, to actuate a switch in an electrical circuit including said electrical transmission means to enable the transmission of said electrical output signal.

4,530,248

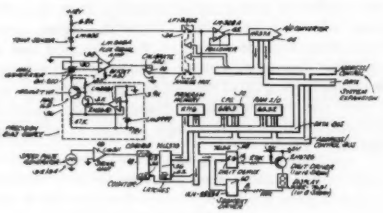
DYNAMOMETER HAVING TORQUE AND HORSEPOWER READOUT

Chester L. Munson, 1709 35th St., Kenosha, Wis. 53140

Filed Aug. 12, 1983, Ser. No. 522,646

Int. Cl.³ G01L *3/22, 3/24*

U.S. Cl. 73—862.17 **4 Claims**



1. An inductor dynamometer having a non-rotating frame,

a field coil fixed in the frame,

an inductor ring fixed in the frame,

a rotor mounted in the frame for rotation inside said ring and spaced from the ring by a gap,

means responsive to flux density to develop a control signal indicative of the flux density at said gap,

means for developing a control signal indicative of the rotational speed of the rotor,

computer means for processing both said control signals to provide an output indicating the horsepower being absorbed by the dynamometer,

said computer means also providing outputs indicating the torque and speed of the dynamometer, torque being calcu-

lated in said computer means according to the following formula:

$$T = \frac{B^2 f}{r + sf}$$

where:

B is the flux density at the gap

f is rotational frequency in cycles per second

r is a constant proportional to the effective resistance of the inductor ring, and

s is a constant proportional to the effective inductance of the inductor ring.

4,530,249

DYNAMOMETER DEVICE

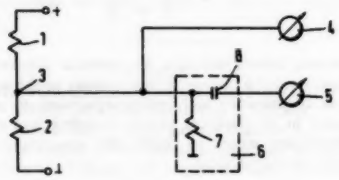
Gerhard Lechler, Mühlenstrasse 58, D-1000 Berlin 46, Fed. Rep. of Germany

Filed Mar. 27, 1984, Ser. No. 593,815

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1983, 3313620

Int. Cl.³ G01L *5/12*

U.S. Cl. 73—862.54 **10 Claims**



1. A device for measuring forces by means of at least one anti-friction bearing, the outer ring and/or inner ring of which are or is provided with strain gauges arranged at different measurement points, which serve to detect overroll extensions, whilst at least two strain gauges are connected as a half-bridge in each case, wherein one strain gauge (1) of the two strain gauges (1, 2) connected as a half-bridge is adapted to a material with a different coefficient of expansion from the other strain gauge (2) of the half-bridge, whilst the signal, exhibiting a temperature-dependent direct-voltage fraction and a force-dependent alternating-voltage fraction, which is tapped from the center tapping (3) of the half-bridge is feedable to a filter (6) to filter out the alternating-voltage fraction, and whilst the separated fractions are detectable each by an indicating instrument (4, 5, 12).

4,530,250

METHOD FOR SAMPLING SUB-MICRON PARTICLES

Don D. Gay, Aiken, and William G. McMillan, Ulmers, both of S.C., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 12, 1984, Ser. No. 599,292

Int. Cl.³ B01D *50/00*

U.S. Cl. 73—863.12 **10 Claims**

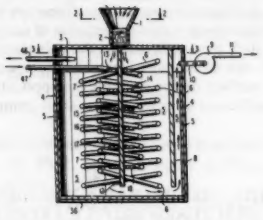
1. A method for sampling sub-micron sized particles, comprising:

passing a volume of air through a filter which effectively traps airborne particles having diameters of greater than or equal to 0.3 micron;

chilling the air to a cryogenic temperature in a collection chamber so that moisture in the air freezes out trapping sub-micron sized particles in an ice lattice;

exhausting the air from the collection chamber;

melting the ice into a chilled liquid;



passing the liquid through a filter which is capable of removing sub-micron sized particles from the liquid;

whereby samples of sub-micron sized particles are collected.

4,530,251

APPARATUS FOR TRANSMITTING MOTION TO WORK-SUPPORTING TABLES OF MACHINE TOOLS AND THE LIKE

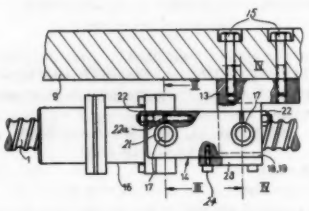
Karl Henle, Reinbek, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Jul. 1, 1983, Ser. No. 510,408

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1982, 3228690

Int. Cl.³ F16H *29/20*

U.S. Cl. 74—89.15 **4 Claims**



1. Apparatus for transmitting reciprocatory motion to a mobile component, particularly for moving back and forth a work-supporting table with reference to the frame of a machine tool, comprising an elongated rotary feed screw; motor means for rotating said feed screw; a nut meshing with said feed screw; and means for articulately connecting said nut with said component, comprising a single pair of links disposed at the opposite sides of and being parallel to said feed screw, first pivot means articulately connecting said links to said nut for angular movement about a first axis, second pivot means articulately connecting said links to said component for angular movement about a second axis which is parallel to said first axis, means for rigidly connecting said links to each other, bearings for said pivot means, and means for eliminating play between said bearings and the respective pivot means.

4,530,252
LONG PATH LENGTH MECHANISM FOR AUTOMATIC INSERTION AND EJECTION OF AN INFORMATION CARRIER

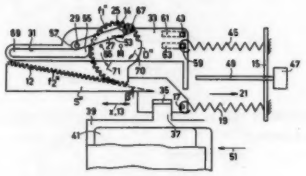
Heidrun Sarges; Klaus Kommoss, both of Wetzlar-Neunheim, and Valentin H. Schütte, Wetzlar, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 30, 1982, Ser. No. 393,942

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1981, 3126497

Int. Cl.³ H04N *7/14;* **F16H** *35/00, 21/44, 21/54*

U.S. Cl. 74—388 R **10 Claims**



1. A device for automatic insertion and ejection of an information carrier into and out of a holder, which device comprises

a carrying element which cooperates with the information carrier,

a slidable drive member which is moved by the carrying element,

a return spring connected to the drive member and arranged to be tensioned during insertion of an information carrier,

an over-center mechanism, comprising a rotary drive member which engages the slidable drive member, and a connecting rod to which the rotary drive member is eccentrically coupled, the end of the rod which is remote from a point where said rod is coupled to the rotary drive member being guided longitudinally, and

an over-center spring which exerts a biasing force on the connecting rod, which biasing force has a greater effect than that of the return spring, the over-center mechanism thereby having a latched position when it is rotated beyond the over-center point,

characterized in that the rotary drive member is a disk having an external drive surface, the distance between the drive member center of rotation and the drive surface increasing in the direction in which said disc rotates during insertion, and in that the slidable drive member is a drive rod arranged to cooperate with the rotary drive member, which slidable member comprises a contact surface which engages the drive surface of the disc.

4,530,253
GEAR ASSEMBLY FOR AUTOMOBILE GEAR TRANSMISSION

Kazuhito Ikemoto; Yukio Terakura, and Takashi Miyake, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Dec. 1, 1982, Ser. No. 446,053

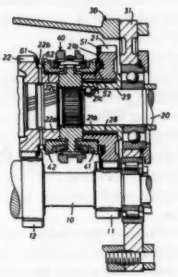
Claims priority, application Japan, Dec. 23, 1981, 56-208532

Int. Cl.³ F16H *55/18*

U.S. Cl. 74—440 **4 Claims**

1. In a gear assembly having a pair of driving and driven gears permanently in meshing engagement with each other to provide a torque transmission therebetween, an additional gear axially slidable and rotatable on a hub projection of either one of said gears and being permanently in meshing engagement with the other gear to rotate at a gear ratio different from that of said driving and driven gears, a synchronizer mechanism assembled adjacent to said additional gear and having a spline piece fixed to the hub projection of said gear, and resilient means for resiliently pressing said additional gear against one end face of said gear adjacent thereto,

the improvement wherein said resilient means is a compression spring arranged in surrounding relationship with the hub projection of said gear and being engaged at its one end with said additional gear and at its other end with the spline piece of said synchronizer mechanism.



4,530,254
FASTENING DEVICE FOR TILTABLE STEERING ASSEMBLY

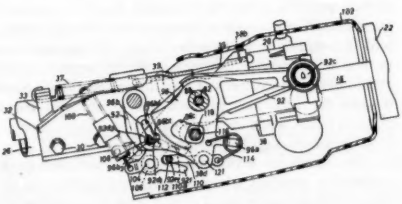
Shuhei Toyoda; Yuji Yokoya, both of Toyota, and Hakumi Ishii, Okazaki, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 8, 1983, Ser. No. 530,245

Claims priority, application Japan, Sep. 9, 1982, 57-137143[U]

Int. Cl.³ B62D *1/18*

U.S. Cl. 74—493 **8 Claims**



1. In a fastening device for a tiltable steering assembly including a steering shaft tiltably connected to steering gear means in an automotive vehicle, a tubular housing having said steering shaft journalled therein, and a steering wheel mounted on said steering shaft, said fastening device comprising:

a stationary bracket mounted on a portion of the vehicle body structure and having a pair of opposing arms;

a movable bracket secured to said tubular housing and having a pair of opposing arms pivoted to the pair of arms of said stationary bracket for permitting angular adjustment of said steering wheel, one of the arms of said movable bracket being integrally provided with a toothed portion;

a latch member pivoted to a portion of said stationary bracket and movable between a locked position in which said latch member is in engagement with the toothed portion of said movable bracket to lock said steering wheel in a selected angular driving position and an unlocked position in which said latch member disengages from the toothed portion of said movable bracket to permit free movement for angular adjustment of said steering wheel;

a manual lever pivoted to said stationary bracket to be moved perpendicularly with respect to the pivot axis from

its released position toward a predetermined angular position;

an engaging element provided on said manual lever to be engaged with said latch member when said manual lever is released and to be disengaged from said latch member when said manual lever is moved toward the predetermined angular position;

first resilient means for biasing said manual lever toward its released position to engage said engaging element with said latch member for effecting movement of said latch member toward the locked position and maintaining it in the locked position;

second resilient means interconnected to said stationary and movable brackets to bias said steering wheel into a remote position upwardly with respect to the selected angular driving position;

cam means for effecting movement of said latch member toward the unlocked position when said manual lever is moved to the predetermined angular position and for effecting movement of said latch member toward the locked position when said manual lever is released;

the improvement comprising:

a movable plate pivoted to said stationary bracket coaxially with said movable bracket;

a second latch member pivoted to said movable plate and movable between a first position in which said second latch member is in engagement with the toothed portion of said movable bracket to connect said movable plate with said movable bracket and a second position in which said second latch member disengages from the toothed portion of said movable bracket to permit relative movement between said movable plate and said movable bracket;

third resilient means to bias said second latch member toward the first position;

second cam means cooperable with said first-named cam means to position said first-named latch member in the locked position when said manual lever is released, to permit relative movement between said movable plate and said first-named latch member when said manual lever is moved to and from the predetermined angular position, and to permit movement of said first-named latch member toward the unlocked position and retain said movable plate in place when said manual lever is moved over the predetermined angular position; and

third cam means for maintaining said second latch member in the first position when said manual lever is in its released position and moved to and from the predetermined angular position and for effecting movement of said second latch member toward the second position when said manual lever is moved over the predetermined angular position.

4,530,255

ROTARY BALANCE MOTOR

James H. Haslam, 113 Southport New Rd., Tarleton, Near Preston, Lancashire, England

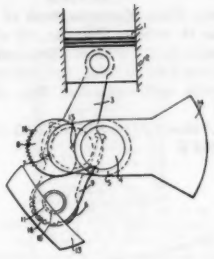
Continuation of Ser. No. 145,103, Apr. 30, 1980, abandoned. This application Mar. 8, 1984, Ser. No. 585,633

Claims priority, application United Kingdom, May 1, 1979, 7915142

Int. Cl.³ F16C *3/06*

U.S. Cl. 74—604 **13 Claims**

1. A reciprocating machine of the type wherein reciprocating movement of a piston or the like is translated into rotation of a crankshaft via a connecting rod on a crankpin of the crankshaft, said connecting rod having a first bearing in which the crankpin is journaled, the connecting rod having an extension on its end remote from the piston and having a second bearing at the remote end of the extension and a mass or weight of a shape which mates with another formation on the crankpin and is rotatable on the second bearing on said extension so as to be movable periodically with movement of the connecting rod and relative to the connecting rod, said extension being a



continuation of said connecting rod beyond said crankpin and the first bearing.

4,530,256

MOTOR VEHICLE TRANSMISSION HAVING A VARIABLE PULLEY IN PARALLEL WITH AN INTERLOCKING GEAR

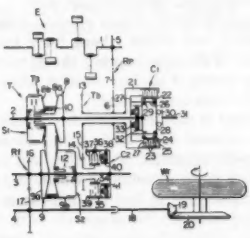
Torao Hattori, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 8, 1983, Ser. No. 473,270

Claims priority, application Japan, Mar. 10, 1982, 57-37416; Mar. 10, 1982, 57-37417; Mar. 12, 1982, 57-39027

Int. Cl.³ F16H *37/00*

U.S. Cl. 74—689 **6 Claims**



1. A transmission for a motor vehicle comprising an input shaft connected to a crank shaft of an engine of the motor vehicle; an output shaft connected to a driving wheel of the motor vehicle; a V-belt stepless variable speed gear interposed between said input and output shafts, said V-belt stepless variable speed gear being capable of providing different gear ratios of said input and output shaftes on a stepless basis during its operation; an interlocking transmission gear installed between said input and output shafts parallel to said stepless variable speed gear, said interlocking transmission gear being capable of providing a preset gear ratio of said input and output shafts during its operation; a hydraulically operated first clutch of a normally-closed type provided on said input shaft for operating said V-belt variable speed gear when said first clutch is connected; a hydraulically operated second clutch of a normally-open type provided on said output shaft for operating said interlocking transmission gear when said second clutch is connected; and a control valve causing the hydraulic cylinders of said first and second clutches to communicate alternately with an oil pump and an oil tank.

4,530,257

FRICTIONAL RING GEAR

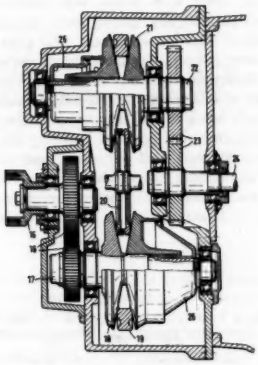
Jurgen Helling, Botzelaer 26A, B-4680 Gemmenich, Belgium, and Ulrich Rohs, Roonstr. 11, D-5160 Duren, Fed. Rep. of Germany

Filed Jun. 9, 1983, Ser. No. 502,453

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1982, 3222481

Int. Cl.³ F16H *15/50, 15/08*

U.S. Cl. 74—796 6 Claims



1. A friction ring gear for stepless transmission of a rate of revolutions comprising:

(a) at least three driving disks supported on a segment of a circle, said driving disks each including a pair of opposing disk halves axially movable against a spring force and further including a cylinder actuable by a pressure medium controlling the axial movement of the disk halves, said disk halves of each driving disk forming a wedge-shape therebetween;

(b) a one-piece friction ring formed of a rigid material connecting all driving disks and guided in their wedge-shaped recesses; and

(c) a support disk on a floating axle comprising a pair of axially displaceable disk halves each of which includes a spring elastic disk ring, a support ring disposed between said disk rings having a diameter less than the outer diameter of the disk rings and greater than the inner diameter of the disk rings, a central hub engaging each disk ring from the exterior thereof, and actuating means for moving said hubs axially with respect to each other so as to axially displace said disk halves.

4,530,258

SAW CHAIN SHARPENING METHOD AND APPARATUS

Duane M. Gibson, Milwaukie, and Lewis A. Scott, Lake Oswego, both of Oreg., assignors to Omark Industries, Inc., Portland, Oreg.

Continuation of Ser. No. 237,452, Feb. 23, 1981, abandoned, which is a continuation-in-part of Ser. No. 36,842, May 7, 1970, abandoned. This application May 6, 1983, Ser. No. 489,869

Int. Cl.³ B23D *63/00*

U.S. Cl. 76—25 A 49 Claims

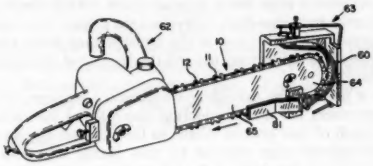
1. A sharpener for a saw device having a plurality of cutter teeth provided with top sharpenable surfaces and movable along a predetermined curved path, said sharpener comprising:

a flexible abrasive member,

and locating means mounted relative to said predetermined path for positioning said flexible abrasive member adjacent said path, said member having an abrasive surface disposed thereby generally along said path and facing the top sharpenable surfaces of said cutter teeth,

support means on said locating means engaging said flexible abrasive member at spaced apart points and restraining said abrasive member such that it intercepts said path with said abrasive surface engaging the said top sharpenable surface of said cutter teeth,

said flexible abrasive member being free of external support



between said support means and being self-supporting therebetween whereby it is free to move toward and away from said path in the area of contact of said abrasive member with the cutter teeth top surfaces so that said member can assume the contour of the path of the cutter teeth top surfaces in said area of contact.

4,530,259

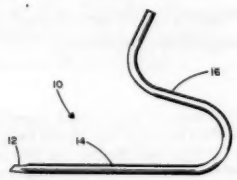
HOME CARE DENTURE GRINDING INSTRUMENT

Bruce T. Campbell, Lakewood, Calif., assignor to Camdent Laboratories, Cerritos, Calif.

Filed Jul. 6, 1983, Ser. No. 511,190

Int. Cl.³ B21K *5/00*

U.S. Cl. 76—101 D 1 Claim



1. A method of manufacturing a grinding tool of the type adapted for adjusting dentures, the method comprising the steps of:

cutting a carbon steel wire to a selected straight length,

bending about one-half of said length of wire to form a handle,

stamping the terminal portion of the unbent half of said length of wire to form a shaft terminating in a blade, and

grinding at least one surface of said blade at a selected angle relative to the longitudinal axis of said shaft to form a grinding edge.

4,530,260

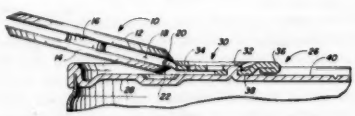
CAN OPENER TOOL

Leon G. Holka, P.O. Box 18198, Fountain Hills, Ariz. 85268

Filed Mar. 28, 1984, Ser. No. 594,220

Int. Cl.³ B67B *7/40*

U.S. Cl. 81—3.55 12 Claims



1. An opener tool for use in opening cans of the type having a lid with a scored closure for inward displacement by a tab

structure that is attached to the lid by a rivet with the tab structure including a lever end and an opener end, the lever end being adapted for movement in an arcuate path to move the opener end into displacing engagement with the closure, said opener tool comprising:

(a) a spaced apart parallel pair of planar members defining a peripheral edge and a groove means which opens onto the peripheral edge from between said planar members for receiving the lever end of the tab structure when said planar members are moved toward the lever end of the tab structure;

(b) a post means extending transversely between said planar members for interconnection thereof and for defining the depth of said groove means so that at least a portion of the peripheral edge defined by said planar members will be proximate the rivet of the tab structure when the lever end thereof is fully received in said groove means; and

(c) at least one of the oppositely facing edges of the peripheral edge defined by said pair of planar members being beveled to guide the peripheral edge into bearing engagement with the head of the rivet of the tab structure when the lever end thereof is fully received in said groove means.

4,530,261

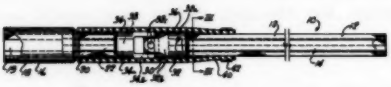
WRENCH ASSEMBLY FOR USE WITH MINE WALL SUPPORT BOLTS

Robert M. Ventura, P.O. Box 185, Beallsville, Pa. 15313

Filed Dec. 27, 1983, Ser. No. 565,590

Int. Cl.³ B25B *13/00*

U.S. Cl. 81—177 UJ **2 Claims**



1. A mine wall support bolt wrench assembly, comprising:

an elongated shaft having a continuous longitudinal passageway therethrough and having one end shaped to be received and secured by a drive mechanism of a mine support bolting machine;

socket means for snuggly receiving the head of a mine support bolt, said socket means having a continuous longitudinal passageway extending therethrough;

universal joint means for joining said shaft at its outer end to said socket means;

said shaft passageway and said socket passageway communicating with each other across said universal joint; and

resilient, impermeable, non-metallic sleeve means surrounding the entirety of said universal joint means for limiting the magnitude of movement of said universal means when a lateral force above a predetermined value applied to either of said shaft or socket means is exceeded and for maintaining the continuity between said passageways and for sealing said universal joint means against infusion of solid and fluid matter.

4,530,262

RELEASABLY LOCKABLE ARTICULATED HANDLE

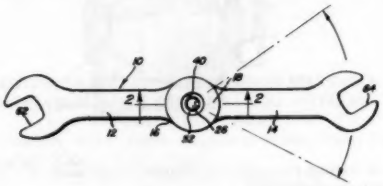
Larry D. Pownall, 3731 E. Altadena Ave., Phoenix, Ariz. 85028

Filed May 31, 1983, Ser. No. 501,063

Int. Cl.³ B25G *1/12*

U.S. Cl. 81—177.9 **2 Claims**

1. A releasably lockable articulated handle assembly including a pair of elongated arm members disposed in generally the same plane and including one pair of overlapped ends pivotally interconnected for relative swinging movement of said arm members about an axis generally normal to said plane, lock means shiftably supported relative to said arm members and movable between a first active position locking said arm members in angularly displaced positions relative to each other and a second inactive position allowing at least substantially free relative angular displacement of said arm members, one of said overlapped ends defining a first laterally outwardly opening recess and a non-circular shank portion projecting outwardly of the central portion of the inner end of said recess, said shank portion being at least generally coaxial with said axis, the other of said overlapped ends defining a head thereon received in said recess and defining a second laterally opening recess opening axially into said first recess, said lock means including a toothed gear axially slidable on said shank portion and non-rotatable relative thereto, said second recess including peripherally spaced teeth with which said toothed gear may be meshed, said peripherally spaced teeth being confined to an inner portion of said second recess, said gear being disposed within the inner portion of said second recess and meshed with said teeth when in said active position and being disposed in an outer portion of said second recess out of meshed engagement with said teeth when in said inactive position, said arm members including end wall portions defining the inner limits of said recesses, said end wall portion of said other overlapped end having an opening formed therethrough rotatably receiving the free end of said shank portion therethrough and including an outer end counterbore, a retaining member releasably



engaged with said free end of said shank portion and seated in said counterbore, said shank portion being polygonal in cross section and having a longitudinal groove formed in one side surface thereof opening endwise outwardly of the shank portion end remote from said one overlapped end wall portion, the last mentioned end wall portion having a small opening formed therein registered with the adjacent end of said groove, said toothed gear including a central polygonal opening formed therethrough of a size and shape corresponding to the cross-sectional size and shape of said shank portion, one of the sides of said opening corresponding to said one side surface of said shank portion including an elongated thrust bar fixed thereon extending longitudinally through said central opening and outward beyond the axial end faces of said toothed gear, the end of said bar corresponding to said last mentioned end wall portion being longitudinally shiftable through said small opening and the other end of said bar being longitudinally extendable and retractable relative to the end of said groove which opens through the end of said shank portion remote from said one overlapped end wall portion, said gear and shank portion including coacting means yieldingly retaining said gear in said active position.

4,530,263

HOLDER AND ATTACHMENT FOR LATHE TOOLS

Bruno Müntel, Hoiersdorfer Str. 4, Schöningen, D - 3338, Fed. Rep. of Germany

PCT No. PCT/DE83/00039, § 371 Date Nov. 9, 1983, § 102(e) Date Nov. 9, 1983, PCT Pub. No. WO83/03215, PCT Pub. Date Sep. 29, 1983

PCT Filed Mar. 8, 1983, Ser. No. 555,878

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1983, 3208923

Int. Cl.³ B23B *29/22, 29/28*

U.S. Cl. 82—36 R **9 Claims**

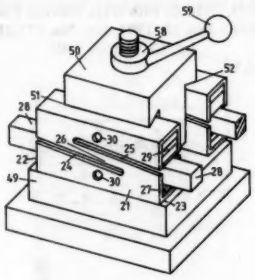
1. A holder for lathe tools, comprising:

an elongated sleeve receiving a tool shank and plurality of shims fixing the height of the tool shank within said sleeve,

said sleeve having at least one wall, a portion of which is made of a ferromagnetic material;

clamping means securing the tool shank and the plurality of shims within said sleeve; and

a clamping head to mount said sleeve onto a lathe support, said clamping head having a wall slidably engageable with



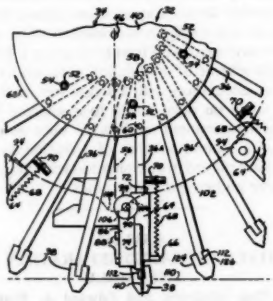
said sleeve wall and having a magnet mounted therein flush with the surface thereof and disposed for engagement with said ferromagnetic portion of said sleeve wall so as to ensure contact between said walls and means clamping said sleeve to said clamping head.

4,530,264

CARRIER CUTTING WHEEL

Eugene F. Felstehausen, Hoopeston, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jun. 30, 1983, Ser. No. 509,565
Int. Cl.³ B26D *1/62*
U.S. Cl. 83—175 **14 Claims**



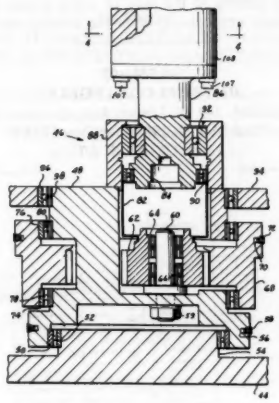
8. A carrier cutting wheel in combination with a plastic strip assembled with a plurality of container means for rotatably mounting said wheel, means for rotating said wheel in timed relation with the movement of said plastic strip, said cutting wheel lying above and substantially in a plane perpendicular to said strip and parallel to the direction of movement thereof, a plurality of spaced projections carried by said cutting wheel in arcuately spaced positions, and cutting means carried by said cutting wheel in arcuately spaced positions for severing said strip at spaced intervals, each projection adapted to wedge against four adjacent containers to tighten said strip simultaneously adjacent to laterally spaced regions of the strip for severance.

4,530,265

ROTARY CUTOFF KNIFE

Frank X. Lee, New York; Leonard C. Krimsky, Spring Valley, and Henk Van Rietschoten, Monroe, all of N.Y., assignors to Worldwide Converting Machinery, Inc., Allendale, N.J.

Filed Nov. 3, 1982, Ser. No. 438,762
Int. Cl.³ B26D *1/56*
U.S. Cl. 83—337 **6 Claims**



1. An improved rotary knife assembly for severing a moving web including in combination, means for moving a web along path, a support, a crank member, means mounting said crank member on said support for rotary movement around a first axis from a first position remote from said web path to a second position adjacent to said web path, a knife bar, a knife on said bar, means mounting said knife bar on said crank member for rotary movement around a second axis parallel to and spaced from said first axis, first means for rotating said crank at a certain rate in the course of a web severing operation to move the crank member from the first position to the second position, and second means for concomitantly rotating said knife bar over the course of movement of the crank member from said first position to said second position during a severing operation to bring said knife up to at least web speed.

4,530,266

CUTTING UNIT WITH CHAIN SAW FOR CUTTING LOGS

Allan Hedberg, Söderhamm, Sweden, assignor to Stensele Mekaniska Verkstad AB, Soderhamn, Sweden

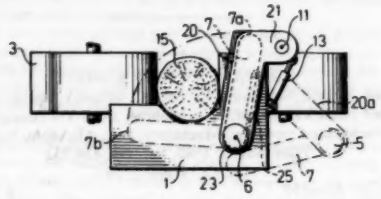
Filed Dec. 12, 1983, Ser. No. 560,227
Claims priority, application Sweden, Jan. 4, 1983, 8300035
Int. Cl.³ B27B *17/00*
U.S. Cl. 83—801 **10 Claims**

1. A unit for cutting a log across its length, comprising a body having means for holding a log and moving the log lengthwise;

a holder movably mounted on said body;

a chain saw having a cutting bar pivotably mounted on said holder, said holder being movable between a first position in which said cutting bar is pivotable in one direction from an initial position for carrying out a cutting operation, and

a second position in which said cutting bar is pivotable in an opposite direction to be returned to said initial position



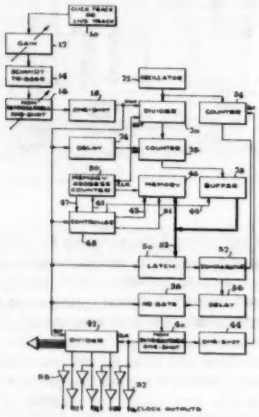
without getting in the way of a log which is advancing lengthwise immediately after the cutting operation.

4,530,267

RHYTHM CONTROLLER

Daniel J. Garfield, 249 W. Linden Ave., Burbank, Calif. 91502

Filed Mar. 7, 1983, Ser. No. 473,046
Int. Cl.³ G10F *1/00*
U.S. Cl. 84—1.03 **5 Claims**



1. A rhythm controller adapted to be coupled to a source of input signals, said source being capable of producing a plurality of input signals beginning at the onset of and continuing during a musical beat interval, for producing a selected number of clock pulses for said musical beat interval comprising:

an oscillator;

first and second counters coupled to said oscillator to count the output thereof;

divider means coupling said oscillator and said first counter to selectively reduce the output frequency of said oscillator to said first counter, thereby lowering the counting rate of said first counter;

input means for generating a pulse at the onset of each beat interval for enabling said first counter to count the divided output of said oscillator for a first beat interval, said input means including means for causing said input means to generate a pulse only at the onset of each beat interval and to filter out or ignore any input signals arriving during said beat interval;

comparator means adapted to receive the count of said first counter for comparing said count for said first beat interval with the count of said second counter during a second subsequent beat interval and for producing a clock pulse upon a coincidence, said clock pulse being operative to reset said second counter, said second counter continuing to recount and to be reset after each coincidence until the end of a beat interval;

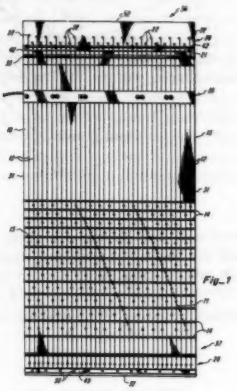
whereby a selected number of clock pulses are produced for said first beat interval.

4,530,268

STRINGED MUSICAL INSTRUMENT

John D. Starrett, 7115 E. 14th Ave., Denver, Colo. 80220

Filed Jan. 19, 1984, Ser. No. 572,216
Int. Cl.³ G10H *3/00*
U.S. Cl. 84—1.16 **17 Claims**



1. A musical instrument played by a musician in a manner similar to a piano comprising, in combination, a fingerboard of generally rectangular plan view with a matrix of laterally extending continuous frets and overlying longitudinally extending strings mounted on said fingerboard, each of said frets passing beneath and thereby associated with all of said strings and each of said strings passing over and thereby apsociated with all of said frets, each of said frets musically spaced so that the difference in pitch between adjacent frets associated with a given string is one half step up or one half step down, said strings physically spaced so that twelve consecutive strings are the same physical distance apart as an octave on a piano keyboard, each of said strings being adapted to be depressed into contact with any one of said frets to produce a vibration in said strings, a first scheme of modulation obtained by user of all of the strings in association with a single fret, said strings being previously tuned on open string to a selected temperament, which string temperament remains the same as a different fret is played, or a second scheme of modulation wherein said tuned strings are played in combination with more than a single fret to achieve higher and lower notes.

4,530,269

REMOTELY INITIATED SEPARATION LATCH ASSEMBLY

William G. Rau, Malvern, and Edward A. Wojtowicz, Bryn Mawr, both of Pa., assignors to Burroughs Corp., Detroit, Mich.

Filed May 12, 1983, Ser. No. 494,065
Int. Cl.³ F41F *5/00*
U.S. Cl. 89—1.14 **10 Claims**

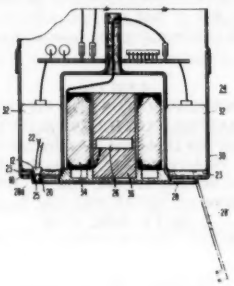
1. A remotely actuated latch assembly comprising in combination:

a plurality of structural members,

an electric match-type device comprising a noncombustible body member having a pair of spaced-apart electrically conductive sections joined to each other by a bridge wire, a rigid mass of combustible material, said rigid mass of

combustible material enveloping said bridge wire and being firmly adhered to said body member, means for applying an electrical potential to said conductive sections for causing said bridge wire to incandesce and to initiate the burning of said combustible material,

at least a first of said structural members being affixed to said noncombustible body member of said electric match-type device, a second of said structural members being coupled to said rigid mass of combustible material of said electric



match-type device, thereby causing said latch assembly to assume a closed state wherein said first and second of said structural members are effectively coupled to each other, and

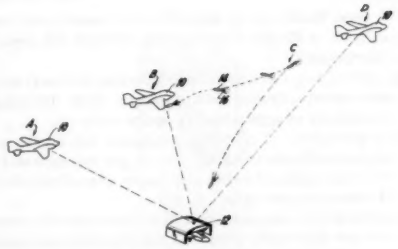
whereupon the burning of said combustible material in response to the application of said electrical potential to said conductive sections destroys the coupling force between said first and second of said structural members and causes said latch assembly to assume an open state.

4,530,270

METHOD OF DIRECTING A CLOSE ATTACK MISSILE TO A TARGET

Herbert G. Denaci, Massapequa Park, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Apr. 24, 1974, Ser. No. 463,776
Int. Cl.[3] F41F *5/00*; F41G *7/00*
U.S. Cl. 89—1.11 **10 Claims**



1. A method of directing a close attack missile to a target, the missile being launched from an aircraft in the direction of the flight path of the aircraft, the method comprising the steps of:

(a) decelerating the launched missile by imparting a thrust thereto in a direction substantially opposite to the flight path of the launched missile so that the horizontal velocity of the missile approaches near zero;

(b) automatically controlling the direction of the thrust imparted to the missile so that the vertical velocity approaches near zero as the horizontal velocity approaches near zero;

(c) automatically reorienting the missile when the resultant horizontal and vertical velocity of the missile approach near zero so that the thrust vector of the missile is pointing almost directly at the target; and

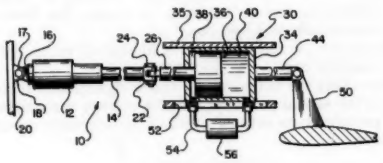
(d) automatically guiding the reoriented missile to the target along the line-of-sight from the missile to the target.

4,530,271

ELECTRIC ACTUATOR SYSTEM WITH HYDRAULIC COUPLING AS PROTECTION AGAINST MECHANICAL JAMMING

Michael J. Cronin, Sherman Oaks, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Filed Jun. 21, 1983, Ser. No. 496,710
Int. Cl.[3] F15B *11/00, 13/00*
U.S. Cl. 91—509 **14 Claims**



1. An actuator assembly for an aircraft having a fixed structure to which a movable control surface is mounted comprising:

a supporting frame attached to said structure;

an actuator mounted to said frame, said actuator having an output shaft;

a hydraulic coupling comprising:

a hydraulic cylinder movably mounted to said structure, said hydraulic cylinder filled with a substantially incompressible fluid;

a pair of connecting members coupled to said hydraulic cylinder, one of said pair of connecting members coupled to said output shaft of said actuator and the other of said pair of connecting members coupled to said control surface;

a sealing member movably mounted in said cylinder, dividing said cylinder into first and second portions, said sealing member cooperating with said fluid to prevent relative movement between said pair of connecting members;

passage means connecting said first and second portions of said cylinder; and

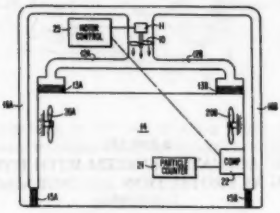
valve means mounted in said passage means, said valve means having a first position sealing off said first and second portions from each other and a second position coupling said first and second portions together;

such that when said valve is in the first position, relative movement between the pair of connecting members is prevented and a substantially solid coupling is made between said actuator and said control surface and when said valve is in the second position the sealing member is free to move relative to said cylinder and, thus, said pair of connecting members are movable with respect to each other, thus allowing the movement of said control surface regardless of actuator output shaft position.

4,530,272
METHOD FOR CONTROLLING CONTAMINATION IN A CLEAN ROOM

Konrad H. Stokes, Los Gatos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 13, 1984, Ser. No. 570,573
Int. Cl.³ F24F 13/00
U.S. Cl. 98—34.5 7 Claims



1. A method for controlling the concentration of particulate contaminants in a clean room environment, said method comprising the steps of:

supplying filtered air under pressure to the environment;

enhancing mixing of the air after filtering by imparting turbulence thereto sufficient to render the filtered air substantially homogenous;

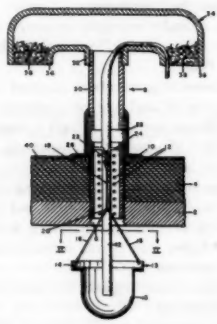
sensing the particle count of the filtered air within the environment; and

controlling the volume of air that is recirculated according to the sensed particle count for thereby maintaining the particle count substantially at a preselectable concentration.

4,530,273
ROOF VENTILATOR

Robert L. Smith, 303 E. Bridge St., Blackwell, Okla. 74631

Filed Apr. 11, 1984, Ser. No. 599,072
Int. Cl.³ F24F 7/02
U.S. Cl. 98—42.01 4 Claims



1. A roof ventilator for a roof having a layered roofing material applied over a roof deck, said ventilator comprising:

a. a conduit adapted to be secured at its lower end in a hole formed in said deck to communicate with the attic space beneath said deck, and extending upwardly from said deck through said roofing material to a point spaced thereabove, and having an outlet to atmosphere at its upper end, the portion of said conduit disposed within the thickness of said roofing material being perforated to admit gases and vapors escaping from among the layers of said roofing material to said conduit,

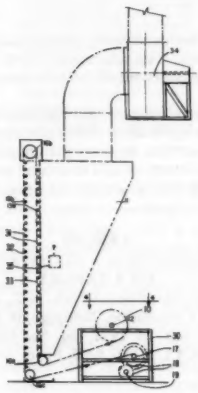
b. a moisture collecting tray having an area substantially greater than the horizontal area of said conduit, said tray including no material stiffer than a resilient material capable of retaining its form under normal stresses, but sufficiently resiliently flexible to be capable of being rolled to a generally tubular form of sufficiently small diameter to be inserted downwardly through said conduit, whereby to be capable of installation from above the roof, and of recovering resiliently to its normal form after insertion, and,

c. means supporting said tray within the attic space, below the lower end of said conduit, whereby to catch and collect any moisture dripping from said conduit.

4,530,274
PROCESS AND APPARATUS FOR FILTERING SPRAY COATING PARTICLES FROM AIR

Robert E. Lyons, 649 Highpoint Clr., Rochester, Mich. 48063, and Arvid C. Walberg, 4443 St. Tropez Dr., Lisle, Ill. 60532

Continuation of Ser. No. 129,688, Mar. 12, 1980, abandoned.
This application Apr. 23, 1982, Ser. No. 371,412
Int. Cl.³ B05C 15/00
U.S. Cl. 98—115.2 5 Claims



4. A spray booth having movable wall, consisting of a continuous layer of flexible filter material, wherein the improvement comprises:

(a) constructing said layer of a flexible mat of closely spaced non-woven extruded polypropylene fibers formeing a multiplicity of approximately square cells,

(b) a multiplicity of randomly positioned non-woven polypropylene fibers extending from the mat into each said cell to fill each said cell with a multiplicity of random sub-cells of submicron-size openings, and

(c) grids of back-up members, which are electrically conductive and electrically grounded, for directing and supporting said continuous layer of flexible filter material.

4,530,275
TACO BOAT FRYER

John S. Stickle, Carollton, Tex., and Louis F. Sabatasso, 20 Burning Tree, Newport Beach, Calif. 92660, assignors to Louis Sabatasso, Newport Beach, Calif.

Filed Mar. 29, 1984, Ser. No. 594,837
Int. Cl.³ A47J 37/12
U.S. Cl. 99—353 10 Claims

1. Cooking apparatus comprising:

a plurality of foldable product carrier sections, each carrier section having a leading margin and a trailing margin, the

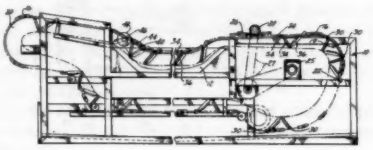
trailing margin of each section being pivotally joined to the leading margin of following adjacent carrier section to form a continuous closed loop, each carrier section being collapsible from a substantially open condition to a closed condition by moving the leading and trailing margins of each section together,

an elongated shallow vat adapted to hold hot cooking fat,

guide means directing the linked carrier sections successively in a path along the length of the vat,

means positioned adjacent one end of the vat for pushing each of the sections in succession toward the vat along the guide means, said pushing means including means for urging the trailing margin of each section toward the leading margin to close each carrier section as it is advanced toward the vat, the carrier sections advancing under the urging of the pushing means along the length of the vat in the closed condition,

each product carrier section comprising first and second frames having openings through which the hot cooking fat can flow, hinge means joining the two frames together along a pivot axis extending transverse to the direction of movement of the carrier section, a plurality of porous male mold members secured to one frame, a plurality of mating porous female mold members secured to the other frame, the male mold members moving into the female mold members when the hinged frames are moved together by said means for pushing the margins of the carrier sections together.



4,530,276

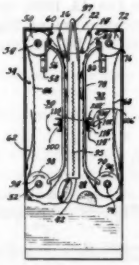
CONTACT TOASTER

Dye O. Miller, South Barrington, Ill., assignor to A. J. Antunes & Co., Addison, Ill.

Filed Jan. 28, 1980, Ser. No. 116,081

Int. Cl.³ A47J *37/08*

U.S. Cl. 99—386 **8 Claims**



1. An assembly for toasting food products comprising:

a housing,

a product inlet and product outlet defined in said housing,

a chamber defined by said housing between said inlet and said outlet,

a platen mounted in said housing dividing said chamber into first and second toasting chambers,

means for conveying said food products through said first and second chambers along said platen, said conveying means including a pair of flexible endless belts, each of said belts located in a different one of said chambers, and means for rotating said belts to slide said food products along said platen between each of said belts and said platen, and

means for selectively flexing the portions of said belts adjacent said platen to selectively adjust the position of the portions of the belts adjacent said platen with respect to said platen and with respect to the remainder of said conveyor in order to accomodate food products of different sizes, said flexing means including at least one multi-sided abutment member rotatably mounted in said housing in abutting relationship with said conveying means.

4,530,277

CITRUS FRUIT SQUEEZER

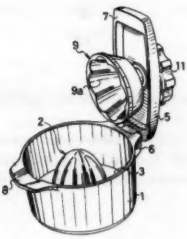
Hideo Matsumoto, 1-22-7, Daitakubo, Urawa-Shi, Saitama-ken, Japan

Filed Jun. 13, 1984, Ser. No. 620,200

Claims priority, application Japan, Dec. 27, 1983, 58-198738[U]

Int. Cl.³ A23N *1/00*; A47J *19/02*

U.S. Cl. 99—506 **6 Claims**



1. A citrus fruit squeezer comprising:

a deep-sided-dish-shaped reservoir having a cone-shaped fruit support member formed on a bottom thereof, a fruit to be squeezed being placed on said bottom, and an inner wall of said reservoir defining a juice-holding chamber in which juice squeezed from the fruit is contained;

a cover hinged to a first peripheral portion of said reservoir, a free end of said cover being able to come close to a second peripheral portion of said reservoir,

an inverted cup-shaped pressing member having a central axis and means mounting the pressing member on said cover only for rotatable movement relative to the cover about said central axis to enable an unlimited number of turns, said pressing member fitting over and around said fruit support member when said free end of said cover comes close to the second peripheral portion,

a means for rotating said pressing member about the central axis thereof.

4,530,278

APPARATUS FOR SEPARATING POMEGRANATE SEEDS, SCANNING APPARATUS AND TECHNIQUES USEFUL IN CONNECTION THEREWITH AND STORAGE AND PACKAGING TECHNIQUES FOR SEPARATED SEEDS

Yoav Sarig, Ra'anana; Yitzhak Regev, Tel Aviv, and Friedrich Grosz, Holon, all of Israel, assignors to State of Israel-Ministry of Agriculture, Beit Dagan, Israel

Filed Nov. 1, 1982, Ser. No. 438,346

Claims priority, application Israel, Jan. 5, 1982, 64710

Int. Cl.³ A23N *4/00*

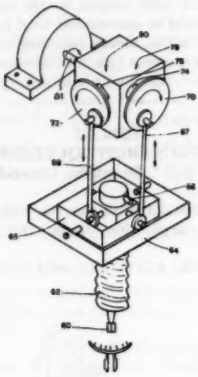
U.S. Cl. 99—547 **4 Claims**

1. Apparatus for separation of individual pomegranate seeds from the remainder of a pomegranate comprising:

means, having two degrees of freedom for directing a pres-

surized jet of gas onto the exposed surface of the interior of a pomegranate, thereby scanning the exposed surface with said pressurized jet at varying angular orientations, said means comprising:

a nozzle arranged to be coupled to a source of pressurized gas;



a frame supporting said nozzle and defining first and second rotational axes; and

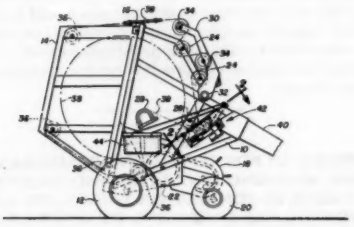
means for providing simultaneous rotation of said frame about said first and second rotational axes at first and second frequencies which are not mutliples of each other.

4,530,279

BREAKAWAY MECHANISM FOR A TWINE WRAPPING APPARATUS

James D. Walker, Lancaster, Pa., assignor to Sperry Corporation, Holland, Pa.

Filed Sep. 25, 1984, Ser. No. 654,298
Int. Cl.³ B65B *13/18*
U.S. Cl. 100—5 **5 Claims**



1. In a roll baling machine having a twine dispensing member, a pinion and a gear rack in intermeshing engagement for effecting pivoting movement of said twine dispensing member, the improvement comprising:

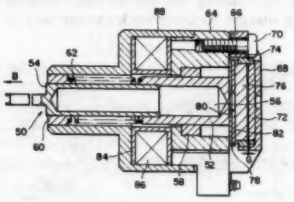
mechanism coupling said twine dispensing member to said pinion while permitting said twine dispensing member to be uncoupled from said pinion when a predetermined load is exerted on said twine dispensing member during said pivoting movement thereof.

4,530,280

PRINTING HAMMER ASSEMBLY WITH A HAMMER DAMPENER COMPRISING TWO OPPOSED PERMANENT MAGNETS

Nobuo Kaneko, Kawasaki; Takeshi Takemoto, Yamato, and Hiroshi Yasuda, Atsugi, all of Japan, assignors to Ricoh Company, Ltd. and Ricoh Watch Co., Ltd., Aichi, both of, Japan

Filed Jan. 13, 1984, Ser. No. 570,492
Claims priority, application Japan, Jan. 17, 1983, 58-5596
Int. Cl.³ B41J *9/42, 9/00*
U.S. Cl. 101—93.02 **12 Claims**



1. A printing hammer assembly comprising:

a printing hammer having an impact surface and a magnetically interactable means, and means for supporting said printing hammer for movement along a predetermined path in a reciprocating manner;

biasing means for normally biasing said printing hammer in a backward direction along said path;

means for producing, when energized, a magnetic flux passing through said magnetically interactable means of said printing hammer to cause said printing hammer to move in a forward direction along said path against the bias force of said biasing means; and

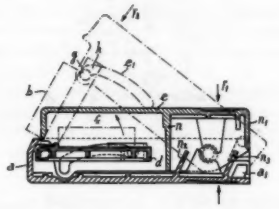
a first permanent magnet and a second permanent magnet disposed in a magnetically repulsive relation such that said first permanent magnet is normally forced to take a predetermined resting position by said second permanent magnet against the bias force of said biasing means.

4,530,281

SMALL SIZE STAMPING DEVICE

Jean Verdenne, Paris, France, assignor to Societe Nouvelle Terseram-Megras, Vincennes, France

Continuation of Ser. No. 377,594, May 12, 1982, abandoned.
This application Feb. 13, 1984, Ser. No. 578,611
Claims priority, application France, May 25, 1981, 81 10336
Int. Cl.³ B41J *27/02*
U.S. Cl. 101—104 **11 Claims**



1. A stamping device comprising:

a box-shaped casing having an open top;

a cover hinged to said casing adjacent a first end thereof for pivotal movement with respect thereto between a first position closing said open top of said casing and a second position opening said open top of said casing;

a support hinged to said casing adjacent a second end thereof

for pivotal movement with respect thereto between an extended position and a retracted position;

a stamp mounted on said support for pivotal movement therewith;

said cover and said support having cooperating guide means for, upon pressure being applied to said cover adjacent a first end thereof to cause said cover to pivot from said first position thereof to said second position thereof, automatically causing said support to pivot from said retracted position thereof to said extended position thereof, whereat said stamp is in an exposed position for use, and for, upon pressure being applied to said cover adjacent a second end thereof to cause said cover to pivot from said second position thereof to said first position thereof, automatically causing said support to pivot from said extended position thereof to said retracted position thereof, whereat said stamp is enclosed within said casing by said cover, said guide means comprising grooves formed in said cover, and studs extending from said support into said grooves; and

means for retaining said support in said extended position thereof and for retaining said cover in said second position thereof.

4,530,282

PRINTING ATTACHMENT AND PRINTING METHOD

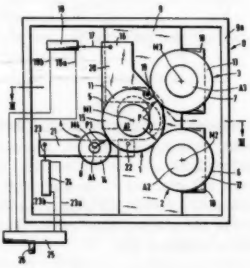
Jürgen Schulz, Bergiusstrasse 32-34, Berlin 44, Fed. Rep. of Germany (D-1000)

Filed May 15, 1984, Ser. No. 610,599

Claims priority, application Fed. Rep. of Germany, May 16, 1983, 3317746

Int. Cl.[3] **B41F** *13/28, 23/40*

U.S. Cl. 101—177 **24 Claims**



1. A printing attachment for rotary printing presses, comprising:

a frame having frame parts;

a first shaft;

holding devices in which the ends of the first shaft are detachably held for movement relative to the frame;

a first cylinder rotatably mounted on the first shaft by means of rolling bearings and interposed between the frame parts;

a first pair of support members supported by the first shaft at opposite ends respectively of the first cylinder so as to be independent of rotation of the first cylinder;

a second shaft detachably mounted on the frame parts;

a second cylinder rotatably mounted for cooperation with the first cylinder on the second shaft by means of rolling bearings and interposed between the frame parts;

a second pair of support members supported by the second shaft at opposite ends respectively of the second cylinder so as to be independent of rotation of the second cylinder, the first and second support members having respective outer supporting surfaces which face one another;

a third pair of support members having support surfaces disposed parallel to one another;

a power operated device for moving the holding devices to move the support surfaces on the first support members into contact with the support surfaces on respective second and third support members at a distance from one another in the manner of a two-point abutment and out of contact therewith to respectively engage and disengage the first cylinder;

and means for adjusting the position of the support surfaces of at least one pair of support members.

4,530,283

CHANGEOVER PROTECTION SYSTEM FOR PERFECTING PRINTING MACHINES

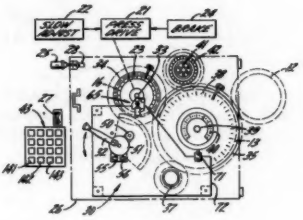
Josef Mathes; Paul Abendroth, both of Offenbach am Main; Roland Holl, Weiterstadt, and Wolfgang Seikel, Offenbach am Main, all of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 27, 1984, Ser. No. 604,740

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1983, 3315445

Int. Cl.[3] **B41F** *5/02, 21/04*

U.S. Cl. 101—230 **19 Claims**



1. A changeover protection system for a sheetfed rotary printing machine having a storage cylinder with grippers and integral calendering means, a turning cylinder having turning grippers, a machine drive for rotating the cylinders, and means for changeover of the cylinders from a first printing mode to a perfecting mode and vice versa, said means for changeover including means for adjusting and locking the relative phase between the cylinders, means for adjusting and locking the relative angular position of the calendering means with respect to the storage cylinder grippers, and means for adjusting the turning grippers to selectively grip the leading or trailing edge of the sheet on the storage cylinder for first form printing or perfecting, said changeover protection system electrically blocking printing by the printing machine during adjustment of said means for changeover, said changeover protection system comprising, in combination,

means for preventing access to said changeover means unless printing by the printing machine is stopped,

first means for detecting locking of said means for adjusting the relative phase between the cylinders and inhibiting printing in the absence of said locking of the means for adjusting the relative phase,

second means for detecting locking of said means for adjusting the relative angular position of the calendering means and inhibiting printing in the absence of said locking of the means for adjusting the relative angular position of the calendering means, and

first electrical means responsive to the relative angular position of said turning grippers with respect to said calendering means when said turning grippers are adjusted for perfecting and inhibiting printing in the presence of substantial angular misalignment, and second electrical means responsive to the relative angular position of said turning grippers with respect to said storage cylinder grippers

when said turning grippers are adjusted for first form printing and inhibiting printing in the presence of substantial angular misalignment, so that during printing mechanical interference of the turning grippers with the calendering means due to improper adjustment is prevented.

4,530,284

ROTARY PRINTING MACHINE WITH LIQUID SUPPLY APPARATUS COMPRISING AN ENDLESS BAND

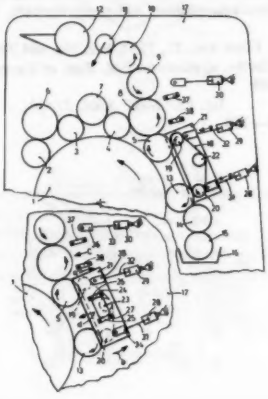
Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Mar. 6, 1984, Ser. No. 586,856

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1983, 3308067

Int. Cl.³ B41F *1/46, 31/06, 31/16, 31/20*

U.S. Cl. 101—350 **11 Claims**



1. Rotary printing machine having at least one plate cylinder and a liquid supply apparatus (**2-16**) including an inker (**2-12**) and a damper (**13-16**), the liquid supply apparatus including liquid supply rollers and an endless band guided over two deflection roller (**19, 20**), the deflection rollers being held between two support plates which have guide elements cooperating with counterpart guide elments attached to the machine,

wherein, in accordance with the invention,

the band (**18**) has a surface accepting ink and damping fluid and extends over the width of the fluid supply rollers; support plate guide means (**23**) associated with said support plates (**21**) and plural sets of counterpart guide elements (**26,27** and **37,38**) associated with the machine cooperate such that either set of counterpart guide elements can selectively be engaged by said support plate guide means for select engagement of said endless band with one or two liquid supply rollers

and guide elements (**24, 25**) formed with first engagement surfaces for engaging the counterpart guide elements (**26, 27, 37, 38**) formed with second engagement surfaces, said first and second engagement surfaces including guide portions and curved portions to permit displacement of the support plates with respect to the machine and hence of the band (**18**), towards and away from the fluid supply rollers at right angles to the axes of two liquid supply rollers (e.g. **5, 13**) and pivoting movement about an axis parallel to the axis of at least one of the deflection rollers (**19, 20**); and

positioning means (**28, 29, 30**) supported on the machine are provided for fixing the support plates (**21**) on the counterpart guide elements (**26, 27**) in at least two different operating positions of the endless band (**18**), in which positions the band is selectively in contact with one or two rollers (**5, 13, 9**) of the liquid supply apparatus.

4,530,285

PRINTING MACHINE INKING MONITORING SYSTEM

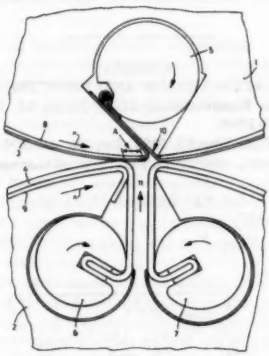
Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Oct. 12, 1983, Ser. No. 541,164

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1982, 3238912

Int. Cl.³ B41F *31/04;* **B41L** *27/06*

U.S. Cl. 101—365 **10 Claims**



1. Inking monitoring and control system for a rotary offset printing machine, having

a plate cylinder (**1**);

a printing plate (**3**) attached to the plate cylinder;

a plate attachment groove (**10**) located in the cylinder for attachment of the printing plate to the plate cylinder;

a rubber blanket cylinder (**2**);

a rubber blanket attachment groove (**11**) formed in the blanket cylinder;

a rubber blanket (**4**) attached to the rubber blanket cylinder in the groove (**11**) and engageable with the printing plate (**3**) on the plate cylinder;

and means (**13**) for sensing ink density of the plate cylinder, in zones (Z) extending circumferentially about the plate cylinder and located axially adjacent each other,

wherein, in accordance with the invention,

the blanket attachment groove (**11**)—in circumferential direction with respect to the blanket cylinder—is wider than the plate attachment groove (**10**) to leave a transverse end strip (A) of the plate (**3**) out of engagement with the blanket (**4**);

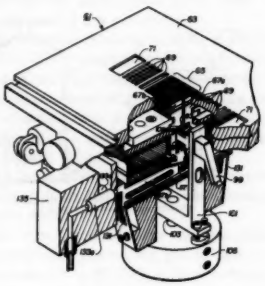
the region of the zones falling within said strip (A) define ink control fields (**12**), located on the plate (**3**) in the end strip (A) thereof and not engaged by the blanket cylinder due to the wider blanket groove,

and the ink density sensing means (**13**) are positioned for sensing the respective ink density in the respective ink control field (**12**) of the respective zones during operation of the machine and consequent rotation of the plate cylinder.

4,530,286
INTAGLIO PRINTING PLATE FOR PRINTING SERIAL MARKINGS

Gerard Samuels, Paoli, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 20, 1984, Ser. No. 642,494
Int. Cl.³ B41M 1/10; B41N 1/00
U.S. Cl. 101—395 11 Claims



1. An intaglio inking plate comprising a body having a major surface with an aperture therein, a plurality of separately-movable bars in said aperture, each bar having two flat substantially-parallel opposed major sides and a flat end that is movable between a first position flush with said major surface and a second position depressed a small distance below said major surface, and means for positioning each of said bars to said flush position or said depressed position, said positioning means comprising

(a) means for moving all of said bars to said flush position,

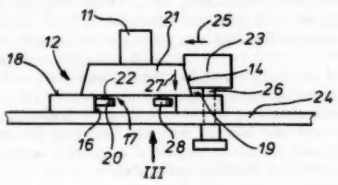
(b) means for blocking the further movement of selected ones of said bars and

(c) means for moving all bars that are not blocked to said depressed position.

4,530,287
CONVEYOR ARRANGEMENT

Walter Sticht, Attnang, Austria, assignor to Stiwa-Fertigungstechnik Sticht Gesellschaft m.b.H., Attnang/Pucheim, Austria

Continuation of Ser. No. 470,917, Mar. 1, 1983, abandoned. This application Dec. 10, 1984, Ser. No. 679,619
Claims priority, application Austria, Mar. 5, 1982, 867/82
Int. Cl.³ B61B 13/00; B65G 35/08
U.S. Cl. 104—168 10 Claims

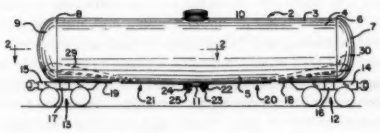


1. A conveyor arrangement useful in an assembly machine for conveying a pallet for a workpiece in a conveying direction, the pallet defining a lateral side face extending in the conveying direction, the conveyor arrangement comprising means for laterally guiding the pallet and means for advancing the pallet in the conveying direction, the guiding means being constituted by the advancing means associated with the lateral side face, at least two guide members fixedly spaced in the conveying direction and positioned opposite the advancing means transversely to the conveying direction and a lateral guide track for the guide members only opposite the advancing means, the advancing means comprising at least two conveyor rollers spaced in the conveying direction, successive ones of the conveyor rollers being spaced a distance shorter than the length of the pallet in said direction, each one of the conveyor rollers being arranged transversely substantially opposite a respective one of the guide members and none of the conveyor rollers being transversely opposite another one of the conveyor rollers, each conveyor roller and the opposite lateral guide track defining a transverse space therebetween permitting the respective guide member to move transversely with respect to the opposite lateral guide track, and the conveyor rollers being arranged to engage the lateral side face of the pallet frictionally and to exert an elastic pressure force against the lateral side face of the pallet in the direction of the opposite lateral guide track, the elastic pressure force having a vertical component pressing the pallet down and being sufficient to press the respective guide member opposite each conveyor roller into engagement with the opposite lateral guide track without play for guidance of the pallet therealong.

4,530,288
HEATED RAILWAY TANK CAR

Richard P. Loevinger, P.O. Box 68, Brandon, S. Dak. 57005

Filed Feb. 27, 1984, Ser. No. 583,834
Int. Cl.³ B61D 5/00, 27/00
U.S. Cl. 105—358 9 Claims



1. In a railway tank car having a tank mounted on tank cradles adjacent bolsters for wheel trucks, said tank having two closed ends and a substantially cylindrical wall having a bottom portion with a cargo outlet valve mounted on said bottom portion intermediate said closed ends, an improved cargo heating means comprising:

first means for heating affixed to said bottom portion of said tank adjacent said outlet valve and extending toward each end of said tank and having a terminal portion intermediate said valve and each of said ends of said tank;

second means for heating sealingly engaged with each end of said tank above said bottom portion of said tank and slopingly extending to sealingly engage said bottom portion of said tank adjacent said terminal portion of said first means, said second heating means being sealingly engaged with said tank for forming a dead air space between said second means and said bottom portion of said tank;

first connective means for placing said first means in fluid flow communication with said second means for enabling a heated fluid to flow through said first means and said second means for heating a liquid cargo contained in said tank above said first and said second means; and

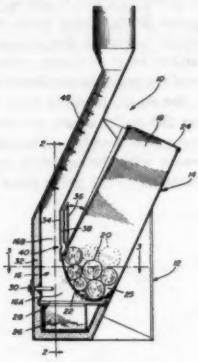
second connective means for placing said first heating means in fluid flow communication with a source of heated fluid for causing said heated fluid to flow into and out of said heating means.

4,530,289

SOLID FUEL FURNACE

Normand Godbout, Sherbrooke, Canada, assignor to Universite de Sherbrooke, Sherbrooke, Canada

Continuation of Ser. No. 449,644, Dec. 14, 1982, abandoned.
This application Aug. 20, 1984, Ser. No. 642,735
Int. Cl.[3] F23K 3/16
U.S. Cl. 110—117 13 Claims



1. A furnace for consuming solid fuel elements comprising:

a combustion chamber;

gravitational feed means including a feeding chute for feeding said solid fuel elements to said combustion chamber; said chute having an upper loading end and a lower feed end adjoining and being open to said combustion chamber; said feed means including a plurality of flexible retaining means extending across said feed end from one side thereof to an opposite side for supporting a load of solid fuel elements in said chute adjacent said feed end and permitting continuous supply of the fuel elements to the lower end of said chute;

air injection means in said combustion chamber spaced from and being located directly opposite said feed end, said injection means injecting air in said combustion chamber toward said feed end to provide a circulation forcing combustion gases to pass through a zone of high temperature in said combustion chamber;

conduction means proximate to said combustion chamber for collecting and guiding said combustion gases from said combustion chamber;

said combustion chamber including a primary compartment and a secondary compartment, said primary compartment including therein said air injection means and said feed end of said feeding chute;

said secondary compartment being located above said primary compartment, said primary and secondary compartment including walls formed of refractory material;

said secondary compartment including a further wall formed of a heat-permeable material;

air admitting means in said further wall for allowing secondary air in said combustion chamber;

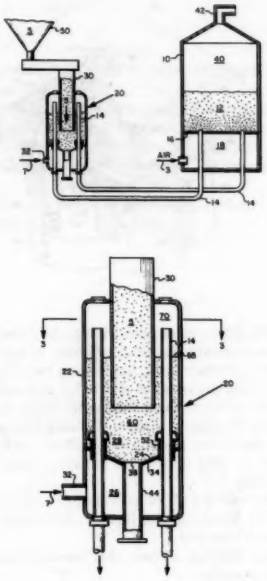
said furnace further comprising outside said combustion chamber, an insulated movable panel forming a chamber in proximity of said air admitting means for preheating said secondary air prior to entering said combustion chamber.

4,530,290

APPARATUS FOR FLUIDIZING A PARTICULATE MATERIAL IN A CONVEYING GAS

Joseph R. Comparato, Bloomfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Feb. 3, 1984, Ser. No. 576,599
Int. Cl.[3] F23G 5/00
U.S. Cl. 110—245 2 Claims



1. An apparatus for fluidizing a particulate material for transport in a conveying gas comprising:

a. A vertically disposed housing defining a chamber therein;

b. A perforated bed support plate having a gas flow passage therethrough, said bed support plate disposed within said housing so as to extend across said housing thereby dividing said chamber into a gas plenum beneath said bed support plate and a particulate fluidizing plenum above said bed support plate;

c. gas supply means opening into said gas plenum for conveying pressurized conveying gas to said gas plenum to pass therefrom through the gas flow passages in said bed support plate whereby a portion of the particulate material fed to the fluidizing plenum is fluidized so as to establish a discrete bed of fluidized material superadjacent said bed support plate and a splash zone within said fluidizing plenum above said discrete bed;

d. particulate feed means extending vertically downwardly through said housing into said fluidizing plenum to open into said fluidizing plenum at a location within said discrete bed of fluidized particulate material;

e. a plurality of transport conduits for receiving particulate material fluidized in the conveying gas from the splash zone and conveying said received particulate material from said housing in the conveying gas, each of said transport conduits comprising an elongated tubular member penetraining said housing from below and extending vertically upward through said gas plenum, thence through said bed support plate and thence into said fluidizing plenum through said discrete bed to open into the splash zone above said discrete bed, each tubular member being independently positionable within the splash zone of the

fluidizing plenum so as to open to the splash zone at any selected distance above said discrete bed, and

f. a plurality of tubular sleeves mounted to and penetrating said bed support plate, one tubular sleeve disposed coaxially in closely spaced relationship about each tubular member thereby defining a narrow annular passage therebetween through which conveying gas may pass upwardly from said gas plenum.

2. An apparatus for fluidizing a particulate material for transport in a conveying gas comprising:

a. a vertically disposed housing defining a chamber therein;

b. a perforated bed support plate having gas flow passages therethrough, said bed support plate disposed within said housing so as to extend across said housing thereby dividing said chamber into a gas plenum beneath said bed support plate and a particulate fluidizing plenum above said bed support plate;

c. particulate feed means opening into the particulate fluidizing plenum so as to deposit particulate material onto said bed support plate;

d. gas supply means opening into said gas plenum for conveying pressurized conveying gas to said gas plenum to pass therefrom through the gas flow passages in said bed support plate whereby a portion of the particulate material fed to the fluidizing plenum is fluidized so as to establish a discrete bed of fluidized material superadjacent to said bed support plate and a splash zone within said fluidizing plenum above said discrete bed;

e. a plurality of transport conduits penetrating said housing and extending into the particulate fluidizing plenum and being independently positionable therein so as to open in the splash zone at a selected distance above said discrete bed, said transport conduits for receiving a particulate material fluidized in the conveying gas from the splash zone and conveying said received particulate material from said housing together with the conveying gas supplied to the particulate fluidizing plenum as a conveying medium for the particulate material, said transport conduits comprising elongated tubular members penetrating said housing from below and extending vertically upward through said gas plenum, thence through said bed support plate and thence through said discrete bed to open into the splash zone above said discrete bed; and

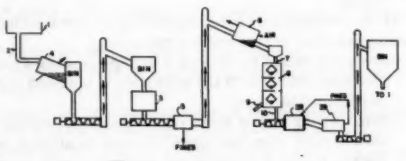
f. a plurality of tubular sleeves mounted to and penetrating said bed support plate, said tubular sleeve disposed coaxially about said tubular member in closely spaced relationship thereby defining a narrow annular passage therebetween through which conveying gas may pass upwardly from said gas plenum.

4,530,291

SEPARATING SPENT AND UNREACTED PARTICLES OF CALCIUM-BASED SULFUR SORBENT

Stanley R. Wysk, Suffield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Sep. 23, 1983, Ser. No. 535,177
Int. Cl.³ F23B *7/00*; **B01J** *8/24*; **B03C** *1/26, 7/12*
U.S. Cl. 110—342 **7 Claims**



1. In a combustion process the method of extracting sulfur compounds from a carbonaceous fuel in which calcium-based sorbent is intimately associated with the carbonaceous fuel from which sulfur compounds are extracted by adsorption into the surface of the sorbent particles, including,

draining from the process a mixture of the carbonaceous fuel from which sulfur compounds have been extracted and particles of the sorbent spent by adsorbing the sulfur compounds which has produced an outer shell on the sorbent particles around unreacted sorbent,

comminuting the particles of spent sorbent to fracture their spent shells and release the unreacted sorbent,

exposing the mixture including spent sorbent shells and unreacted sorbent to an electrically generated physical force to significantly separate the unreacted sorbent from the mixture,

returning the unreacted sorbent to the combustion process for intimate association with the carbonaceous fuel for additional adsorption service,

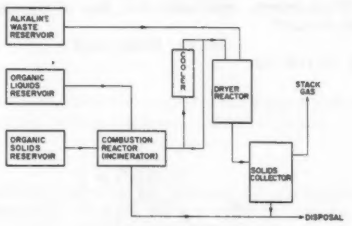
and disposing of the remaining mixture as waste.

4,530,292

TREATMENT OF ACIDIC ORGANIC AND ALKALINE INORGANIC WASTES

Nigel G. H. Guilford, Toronto, and Alan P. Cadotte, Oakville, both of Canada, assignors to Tricil Limited, Mississauga, Canada

Filed Apr. 6, 1984, Ser. No. 597,276
Int. Cl.³ F23G *7/04*
U.S. Cl. 110—346 **6 Claims**



1. A method for simultaneously treating acidic combustible organic waste and alkaline inorganic waste liquor comprising the steps of:

(a) combusting organic wastes in a combustion reactor to produce a hot, acidic gaseous effluent,

(b) directing a flow of liquid alkaline waste to a spray dryer reactor,

(c) directing the said hot, acidic gaseous effluent to the said spray dryer reactor wherein the said gaseous effluent is caused to react with the said alkaline waste to precipitate and simultaneously desiccate the said alkaline waste while the said gaseous effluent is substantially neutralized,

(d) directing the said desiccated precipitate and the said neutralized gaseous effluent from said spray dryer reactor to a solids collection station, and

(e) separating said neutralized gaseous effluent from said precipitate for discharge to atmosphere while the said precipitate is collected for disposal.

4,530,293

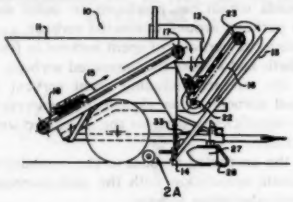
BILLET PLANTER

Rodney A. Stiff, and Malcolm J. Baker, both of Bundaberg, Australia, assignors to Versatile Corporation, Vancouver, Canada

Filed Jun. 11, 1982, Ser. No. 387,466
Claims priority, application Canada, Jan. 26, 1982, 394941
Int. Cl.³ A01C *11/02*
U.S. Cl. 111—2 **8 Claims**

1. A method of planting sugar cane billets comprising the steps of providing a supply of said billets in a main supply bin, conveying said billets from said main supply bin to a sorter

hopper adjacent said main supply bin by a main bin elevator, conveying said billets individually in an end-to-end relationship on alternately opposed sides of at least one chain means, said chain means conveying said billets within a recess extending from said sorter hopper forwardly and upwardly to an upper end of said chain means, said billets being conveyed longitudinally in a direction parallel to the direction of movement of said chain means to a billet chute and planting said billets from said billet chute.



4,530,294

TUBULAR-GOODS HOLDER FOR SEWING MACHINE

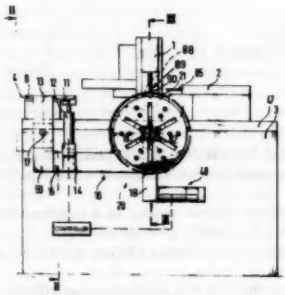
Konrad Pollmeier, Bielefeld, and Philipp Moll, Aachen, both of Fed. Rep. of Germany, assignors to Durkoppwerke GmbH, Bielefeld, Fed. Rep. of Germany

Filed Apr. 6, 1984, Ser. No. 597,448

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1983, 3312317

Int. Cl.³ D05B *35/06*

U.S. Cl. 112—63 **12 Claims**



1. In combination with a sewing machine having a stitch plate defining a sewing station, an apparatus for holding tubular goods for stitching at the station, the apparatus comprising:

a rotatable support adjacent the sewing station;

means for rotating said support about a horizontal support axis;

at least three arcuate segment plates displaceable radially of said support axis on said rotatable support and together forming a segmented drum centered on said axis and having one of said segment plates uppermost in each position of said drum, said plates being displaceable between inner positions defining a circumference smaller than that of the smallest tubular goods to be sewn and outer positions defining a circumference larger than that of the largest tubular goods to be sewn;

spreading means for radially displacing said plates on said rotatable support and thereby changing the diameter of the drum, whereby when a tubular workpiece is fitted over the drum it is tensioned thereover; and

means for displacing said rotatable support vertically adjacent said station and thereby aligning an uppermost segment plate generally with said stitch plate.

4,530,295

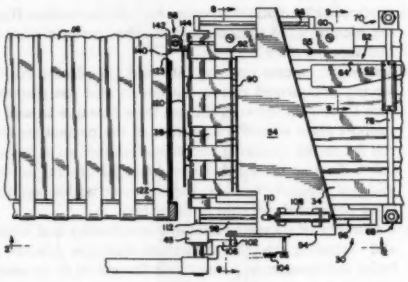
GUIDANCE SYSTEM FOR A WORKPIECE TRANSFER APPARATUS

Maximillian Adamski, Wheeling; David C. Jenkins, Mount Prospect, and Robert L. Kosrow, Hoffman Estates, all of Ill., assignors to Union Special Corporation, Chicago, Ill.

Continuation of Ser. No. 545,804, Oct. 26, 1983, abandoned. This application Jun. 4, 1984, Ser. No. 616,526

Int. Cl.³ D05B *21/00, 27/00, 35/00*

U.S. Cl. 112—121.12 **32 Claims**



1. An automatically operated sewing apparatus including a sewing machine, in combination comprising:

conveyance means for moving a workpiece along a generally planar production path toward a workpiece pick-up point;

a hem forming station arranged along said production path at which station a hem is sewn in a workpiece edge with said sewing machine;

guide means disposed above said conveyance means for engaging the hemmed workpiece edge whereby controlling its laterial disposition relative to a stationary guide means;

a workpiece transfer means mounted for forward and backward movements and capable of engaging the hemmed workpiece about its midpoint and folding same about itself on its backward movement; and

apparatus for positioning each half of the folded and hemmed workpiece together in a proper orientation with each other and relative a predetermined path extending substantially coextensive with said stationary guide means.

11. An automatically operating sewing apparatus including a sewing machine, in combination comprising:

conveyance means for moving a workpiece along a production path from which the workpiece is removed at a predetermined location;

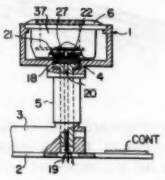
a hem forming station arranged along said production path downstream from said predetermined location at which station a hem is sewn in the workpiece with a sewing machine; and

means for positioning the sewn edge of the workpiece hem during the time the workpiece is removed from said predetermined location.

4,530,296
LOWER THREAD TENSION ADJUSTING DEVICE OF SEWING MACHINES

Hideaki Takenoya, Hachioji; Nobumitu Kuribayashi, Sagamihara, and Eiichi Shomura, Hachioji, all of Japan, assignors to Janome Sewing Machine Industry Co., Ltd., Japan

Filed Jun. 9, 1983, Ser. No. 502,780
Claims priority, application Japan, Jun. 10, 1982, 57-98470
Int. Cl.³ D05B 63/00
U.S. Cl. 112—229 2 Claims



1. Improvement in lower thread tension adjusting device of a sewing machine having a loop taker rotated in a horizontal plane and a bobbin carrier contained in said loop taker and carrying a bobbin loaded with a lower thread, said bobbin carrier having an abutment secured thereto and a resilient plate mounted on said abutment, said resilient plate being movable to and away from said abutment to adjust a tension applied to said lower thread extending between said abutment and said resilient plate, the improvement comprising;

(i) a plurality of windings provided on a stationary horizontal plane adjacent the underside of said loop taker;

(ii) control means selectively operated to progressively energize said windings for producing a revolving magnetic field;

(iii) a magnet turnably mounted on said bobbin carrier and arranged opposite to said windings so that said magnet is rotated in accordance with said revolving magnetic field; and

(iv) actuating means operated in association with said magnet for moving said resilient plate to and away from said abutment in dependence upon the revolving direction of said magnetic field, thereby adjusting the tension applied to said lower thread.

4,530,297
SPEED CONTROL APPARATUS FOR SEWING MACHINE

Katsuhiro Fujikawa, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1984, Ser. No. 573,754
Claims priority, application Japan, Jan. 25, 1983, 58-10128
Int. Cl.³ D05B 69/22
U.S. Cl. 112—275 11 Claims

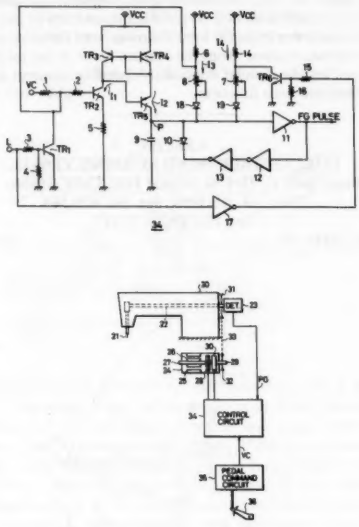
1. A speed control apparatus for a sewing machine, comprising:

(a) means for driving said sewing machine;

(b) means for braking said sewing machine to control and stop said sewing machine;

(c) means for detecting the speed of said sewing machine and the position of a needle of said sewing machine; and

(d) control means for controlling said driving means and said braking means in accordance with output signals from said detector and command signals from command means, said control means comprising at least first and second independently operating speed setting circuits, a switching circuit for selecting an output of one of said speed setting circuits, and means for applying the output selected by

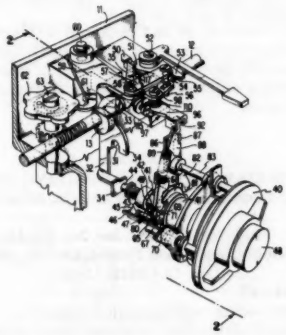


said switching circuit as a speed control signal to at least one of said driving means and said braking means.

4,530,298
ARRANGEMENT FOR SUPPRESSING NOISE AND PREVENTING FAULTY STITCH FORMATION IN A SEWING MACHINE

Jan Szostak, Lincroft, and Henry Schaeflern, Pittstown, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Jul. 26, 1984, Ser. No. 634,511
Int. Cl.³ D05B 27/22
U.S. Cl. 112—315 5 Claims



1. In a sewing machine; a feed regulating cam; a follower for the cam; a manual control including a plunger; a feed regulating control lever; mechanism responsive to the manual control for operably connecting the control lever to the cam follower for movement thereby and for disconnecting the control lever therefrom for movement by the plunger; a spring which urges the cam follower against the cam while the control lever is

operably connected to the cam follower, and biases the lever toward a position of engagement with the plunger; and an additional spring affixed to said mechanism for movement thereby into a position to engage and load the control lever along with the first mentioned spring against the plunger as said mechanism is moved by the manual control to disconnect the control lever from the cam follower, and for movement by said mechanism away from the control lever as the mechanism is moved by the manual control to operably connect the control lever and cam follower.

4,530,299

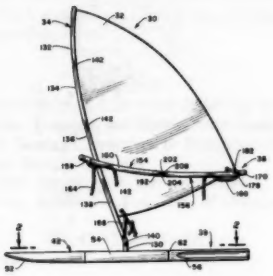
COLLAPSIBLE WIND SURFING VESSEL

Alan Ross, 2400 E. 23rd St., Signal Hill, Calif. 90806

Filed Jul. 10, 1984, Ser. No. 629,568

Int. Cl.³ B63B *35/00*

U.S. Cl. 114—39 **14 Claims**



1. A collapsible sail surfing vessel comprising:

an elongated hull composed of twin hulls located in a spaced-apart juxtaposition relationship, each said hull including first means for folding the said hull to assume a substantial decreased length when not in use, said hulls when in use being connected together by a frame assembly, second means for folding said frame assembly to assume a substantially decreased width when not in use;

mast connecting means mounted on said frame assembly;

a mast connected to said mast connecting means, said mast being universally movable relative to said mast connecting means, third means for folding said mast to assume a substantially decreased length when not in use, said mast being disengageable from said mast connecting means;

a sail attached to said mast; and

a boom connected to said mast and said sail, said boom including fourth means for folding said boom to assume a substantially decreased length when not in use, said boom comprising an elongated structure surrounding said sail when in use.

4,530,300

SLED WITH A BOARD-SAILING RIG

Sami A. E. Tuurna, Steniuksentie 12 B 26, 00320 Helsinki 32, Finland

Filed Nov. 22, 1982, Ser. No. 443,332

Claims priority, application Finland, Dec. 10, 1981, 813977

Int. Cl.³ B62B *15/00*

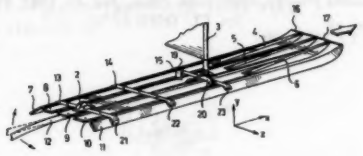
U.S. Cl. 114—43 **6 Claims**

1. A board-sailing mechanism that comprises:

a plurality of gliding parts to permit travel at the surface of a medium and adapted to prevent the board-sailing mechanism from sinking into the body of the medium, said plurality of gliding parts being mechanically secured to one another to form an elongate but flexible structure having a surface to support a surfer, said gliding parts comprising two longitudinally-directed outermost skis and at least one longitudinally-directed ski intermediate the outermost skis, the skis being bound to one another by flexible means in a way that renders the board-sailing mechanism flexible, the outermost skis being disposed at an angle to the surface of the flexible structure so that one end of each outermost ski engages said medium;

sail means secured to the gliding parts to provide propulsion of the mechanism along the surface of the medium; and

fin means secured to the flexible structure and extending



longitudinally rearwardly from the flexible structure to engage said medium, the fin means being flexible in a direction that has a component orthogonal to the surface of the flexible structure, said fin means being an elongate spring member that is vertically flexible as well as flexible about its vertical axis, the skis and the fin means serving, in combination, to render the board-sailing mechanism effective in conditions of both ice and snow.

4,530,301

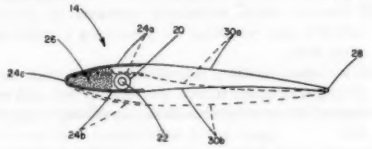
VARIABLE CAMBER AIR-FOIL FOR A VESSEL

Ronald D. Latham, Rte. 3, Box 184-A, Apex, N.C. 27502

Filed Jan. 30, 1984, Ser. No. 574,857

Int. Cl.³ B63H *9/04*

U.S. Cl. 114—102 **9 Claims**



1. A vessel including a wing type airfoil with a rigid leading edge member that is movable independently of a mast and which is mounted on said vessel for powering said vessel through water therein said wing type airfoil comprises:

a. a stationary elongated mast having upper and lower portions;

b. a tip member mounted to the top portion of said mast;

c. a root member secured to the lower portion of said mast;

d. rear connecting means disposed rearwardly of said mast and extending between said tip member and said root member;

e. an elongated vertical rigid leading edge member disposed generally forwardly of said stationary mast and extending vertically between said tip and root members and adjacent said mast throughout a substantial portion of its height;

f. said rigid leading edge member including a leading edge and a pair of spaced apart sides that extend rearwardly from said leading edge toward said mast wherein said sides include terminal rear edges that terminate forwardly of said rear connecting means so as to define a space between said terminal rear edges of said leading edge member and said rear connecting means;

g. a skin covering operatively interconnected between said rigid leading edge member and said rear connecting means and including first and second opposite pliable sides that extend from said rigid leading edge member and said rear terminal edges thereof to where they connect with said rear connecting means to effectively form a variable camber wing portion; and

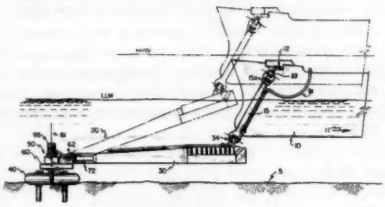
h. mounting means associated with said wing type airfoil assembly independent of said mast for movably mounting said leading edge member and the sides thereof for side to side movement relative to said stationary mast, and wherein said leading edge member and said skin covering form an integral airfoil wing assembly having a rigid leading edge and a pliable variable camber wing portion extending rearwardly from the rear terminal edges of said rigid leading edge member and wherein said rigid leading edge member enables the leading edge of the wing type airfoil assembly to assume a predetermined shape for efficient and effective entry into the wind.

4,530,302

SUBMERGED SINGLE POINT MOORING APPARATUS

Kristen I. Pedersen, Houston, Tex., assignor to Sofec, Inc., Houston, Tex.

Filed Mar. 25, 1983, Ser. No. 478,704
Int. Cl.³ B63B *21/00*
U.S. Cl. 114—230 **12 Claims**



1. Mooring apparatus for mooring and loading or discharging a vessel in a body of water comprising,

submerged mooring base means secured to the floor of the body of water,

submerged unitary yoke means attached at its first end directly to the mooring base means by a triaxial articulation means for allowing the yoke means to move in yaw, pitch, and roll with respect to the submerged mooring base means,

yoke suspension means connected between the submerged second end of the yoke means and the vessel,

weighting means removably disposed in the second end of the yoke for providing in combination with the yoke, triaxial articulation means and yoke suspension means a self-acting resilient restoring force to the vessel with respect to the mooring base,

wherein the yoke means comprises a "V" shaped member having its apex end connected to the triaxial articulation means and having weight holding means disposed outwardly along the two arms of the "V",

wherein the yoke suspension means comprises first and second suspension elements connected between the outward ends of the two arms and support brackets on port and starboard sides of the vessel, and

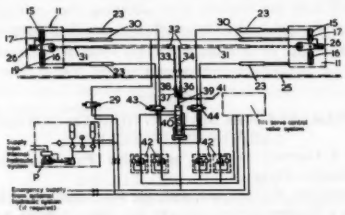
wherein the first and second suspension elements are connected between universal joints mounted on the sides of the vessel and on the outward ends of the two arms of the yoke.

4,530,303

APPARATUS FOR CONTROLLING HYDROPLANES OF MARINE VESSELS

Robert Bird, Loanhead, England, assignor to MacTaggert Scott (Holdings) Ltd., Loanhead, Great Britain

Filed Aug. 11, 1983, Ser. No. 522,007
Claims priority, application United Kingdom, Aug. 12, 1982, 8223264
Int. Cl.³ B63G *8/18*
U.S. Cl. 114—332 **10 Claims**



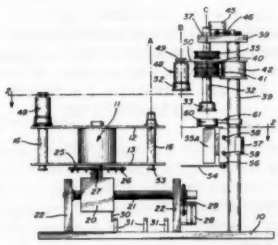
1. Apparatus for controlling the hydroplane of a marine vessel comprising a pair of hydroplane-carrying crossheads **(11)** mounted for movement towards and away from each other to effect retraction and extension of the hydroplanes into and out of the vessel, and first hydraulic means **(14)** for effecting said retraction and extension movement of the crossheads **(11)** characterized in that there is provided second hydraulic means **(15,16,23)** independently and operatively associated with each of the crossheads **(11)** for effecting tilting of each hydroplane about an axis thereof, a sensor **(31,32,33,34)** associated with each hydroplane for continuously detecting the angle of tilt of that hydroplane, a comparator **(36,37,38)** arranged to continuously receive and compare separate signals from each sensor indicative of the angular position of the respective hydroplane and operative in response to a sensed asychronous tilting of the hydroplane to generate an angular misalignment signal, and a servo mechanism **(40,41,42)** receiving such misalignment signal and operative in response to such receipt to correct and sychronize the movement of the hydroplanes.

4,530,304

MAGNETIC LIFTING DEVICE FOR A CELLULAR SAMPLE TREATMENT APPARATUS

Ivan Gardos, Montreal, Canada, assignor to Biomatics Inc., Quebec, Canada

Filed Mar. 8, 1984, Ser. No. 587,617
Int. Cl.³ B05C *3/05, 3/09*
U.S. Cl. 118—66 **7 Claims**



1. In an apparatus for treating samples of cellular materials wherein the samples are contained in a plurality of sample holders joined together to form a stack,

the apparatus including a plurality of stack holding tubes,

each one open at the top, positioned in a circle about a vertical axis of a rotatable carousel,

drive means for rotating the carousel to selectively place one of the stack holding tubes in a treatment position,

the improvement comprising a magnetizable member attached to the top of the stack of sample holders,

a transfer tube having a bottom opening positioned to mate on top of the stack holding tube in the treatment position, a magnetic coil about the transfer tube to hold the magnetizable member in a magnetic field, means to raise and lower the magnetic coil about the transfer tube to raise the stack into the transfer tube allowing the carousel to be rotated, and lower the stack into another stack holding tube

---

4,530,305

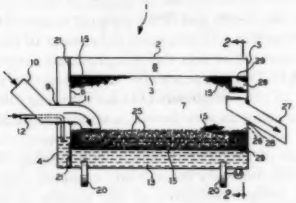
APPARATUS FOR MAKING RUBBER COVERED CARBON BLACK PELLETS

Thomas J. Gunnell, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 367,857, Apr. 13, 1982, Pat. No. 4,440,807, which is a division of Ser. No. 145,908, May 2, 1980, Pat. No. 4,337,294. This application Mar. 7, 1984, Ser. No. 586,951

Int. Cl.³ A23G *3/26*; B05C *3/00*

U.S. Cl. 118—418 **9 Claims**



1. An apparatus for covering carbon black pellet cores with rubber comprising

(a) a chamber confined by walls which at least in part are porous,

(b) inlet conduit means for introducing carbon black pellet cores into said chamber,

(c) latex conveyor means for causing the flow of rubber covering material from outside of the chamber through the porous walls and into the chamber,

(d) means for causing relative motion between said chamber and the carbon black pellet cores therein, and

(e) outlet conduit means for removing the rubber covered carbon black pellets.

4,530,306

COATING DEVICE FOR PLATES

John C. Hovekamp, North Canton, Ohio, assignor to Graphic Enterprises of Ohio, Inc., Canton, Ohio

Filed Jan. 6, 1984, Ser. No. 568,920

Int. Cl.³ B05C *1/02*

U.S. Cl. 118—669 **22 Claims**

1. An improved device for coating offset plates including:

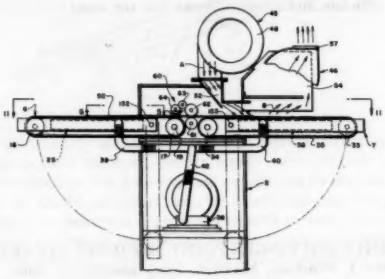
(a) coating roller means adapted to communicate with a supply of coating liquid for transferring said coating liquid to one side of an offset plate, said coating roller means including a fountain roller in communication with the supply of coating liquid, a coating roller for transferring the coating liquid onto an offset plate and a metering roller engageable with the fountain roller and coating roller for transferring a predetermined amount of coating liquid from the coating liquid supply to the offset plate;

(b) drive means for rotatably driving the coating roller means for transferring said coating liquid from the liquid supply to one side of an offset plate;

(c) feed means for delivering an offset plate into the coating roller means to be coated by said roller means;

(d) sensor means for detecting the position of an offset plate with respect to the coating roller means as it is being moved by the feed means; and

(e) coating control means responsive to the sensor means for moving the offset plate into and out of coating engagement with the coating roller means for applying coating



liquid to a predetermined portion of only one side of said plate, said coating control means means including an impression roller for providing pressure against the uncoated side of the offset plate as the coating roller applies the coating liquid to said one side of the plate, and an eccentric shaft rotatably mounting the impression roller and a solenoid actuated arm for controlling movement of the eccentric shaft to move the impression roller toward and away from the coating roller to move an offset plate into and out of coating engagement with the coating roller.

4,530,307

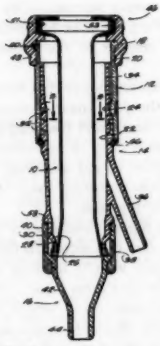
TEAT CUP INFLATION

Paul D. Thompson, Madison, Wis., assignor to DEC International, Inc., Madison, Wis.

Continuation of Ser. No. 433,087, Oct. 6, 1982, abandoned. This application Nov. 13, 1984, Ser. No. 670,630

Int. Cl.³ A01J *5/04*

U.S. Cl. 119—14.49 **1 Claim**



1. An inflation for mounting in a teat cup assembly for use in a milking unit comprising:

an elongated member of an elastomeric material including a tubular portion having a wall consisting of a plurality of

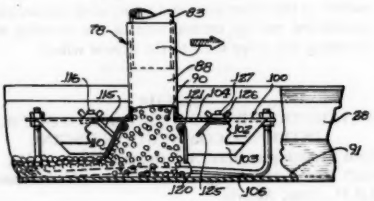
outwardly projecting flute portions connected by a plurality of inwardly projecting flute portions, said outwardly and inwardly projecting flute portions extending vertically and parallel with each other, the number of said outwardly and inwardly projecting portions being in excess of three, the adjacent external surfaces of said outwardly projecting flute portions extending at an acute angle with each other to define a substantially circular internal cross section wherein said flute portions are in the form of undulations spaced along the circumference of said circular cross section to prevent complete closure of the inflation when atmospheric pressure is applied to the exterior of the inflation.

4,530,308

LEVEL CONTROL FOR TROUGH FILLING APPARATUS

Keith A. Sheets, and Devon L. Eby, both of Nappanee, Ind., assignors to Chore-Time Equipment, Inc., Milford, Ind.

Filed Sep. 6, 1983, Ser. No. 529,846
Int. Cl.³ A01K *39/012*
U.S. Cl. 119—52 B **17 Claims**



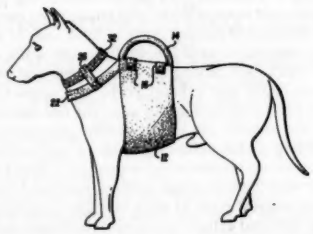
1. A feeding system for delivering feed to feed troughs associated with rows of animal confinement cages, each trough having a continuous bottom, the system comprising, in combination, mobile hopper means for carrying a load of feed past the feed troughs, and delivery means extending from the hopper means for receiving feed from the mobile hopper means and for depositing the feed in the feed troughs, the delivery means including tube means extending from the hopper toward a tube distal end at a trough, a shoe having legs spaced on opposite sides of the tube distal end to support the distal end at a location spaced above the trough bottom, and, as the tube and shoe move over the trough, at least partly form a feed bead in the trough bottom, and a grader blade element pivotally attached to the shoe for smoothing upper portions of the feed bead to a predetermined level.

4,530,309

ANIMAL SUPPORT HARNESS

Doris A. Collins, 1018 Nicks La., South Hill, Va. 23970

Filed May 30, 1984, Ser. No. 615,425
Int. Cl.³ A01K *29/00*
U.S. Cl. 119—96 **10 Claims**



1. A support harness for an animal for use in combination with a neck collar worn by said animal, said harness comprising:

(a) a four-sided belly band, said belly band having two opposing ends and two opposing sides;

(b) means for securing said belly band around the belly of said animal;

(c) a chest strap having two ends, a first end of said chest strap being normally attached to said belly band;

(d) means for securing the second end of said chest strap to said belly band;

(e) means for securing said chest strap to said neck collar; and,

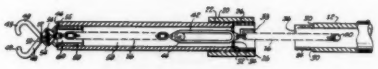
(f) flexible handle means attached to said belly band whereby a human can offer support assistance to said animal, said handle means comprising an arcuate-shaped handle, the ends of said handle being secured near opposite corners of an end of said belly band.

4,530,310

DOG LEASH ASSEMBLY

Bruce Clarke, P.O. Box 8857, Fort Lauderdale, Fla. 33310

Filed Dec. 30, 1983, Ser. No. 567,420
Int. Cl.³ A01K *27/00*; F41B *15/02*
U.S. Cl. 119—109 **5 Claims**



1. A lead for an animal convertible into a nanchuka stick type weapon, comprising:

a handle member means for anchoring a means for interconnecting with a hollow second member means, said handle member means rigidly connectable to said second member means,

said second member means having a passageway therethrough to accommodate said interconnecting means, said second member means slideable along said interconnecting means to contact a retaining means, said second member means connected to said interconnecting means,

said interconnecting means connected to said handle member means for suspending said second member means from said handle member means, and

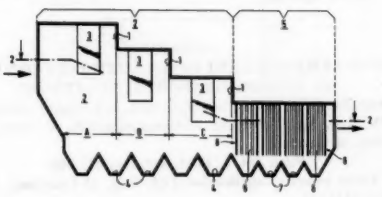
said retaining means connected to said interconnecting means for releasably retaining an animal, said retaining means releasable upon contact by said second member means.

4,530,311

WASTE HEAT BOILER CONSTRUCTION

Tarmo K. Mäntymäki, Merstola, Finland, assignor to Outokumpu Oy, Helsinki, Finland

Filed Mar. 8, 1983, Ser. No. 473,363
Claims priority, application Finland, Mar. 18, 1982, 820942
Int. Cl.³ F22D *7/00*
U.S. Cl. 122—7 R **3 Claims**



1. A waste heat boiler construction comprising a radiation chamber defining a first tunnel portion which has an inlet end and an outlet end and is bounded at its top by a roof, a convec-

tion chamber defining a second tunnel portion which has an inlet end and an outlet end and is bounded at its top by a roof, the first tunnel portion being connected at its outlet end to the inlet end of the second tunnel portion, and the roof of the second tunnel portion being lower than the roof of the first tunnel portion at the inlet end of the first tunnel portion, the roof of the first tunnel portion extending downwards from its inlet end towards the roof of the second tunnel portion in a plurality of steps defined by substantially vertical wall portions and substantially horizontal ceiling portions, said substantially vertical wall portions being disposed essentially transverse to the direction of flow of gas from the inlet end of the first tunnel portion towards the outlet end thereof.

4,530,312

PISTON WITH CROWN COOLING CAVITY AND RADIAL RIBS FORMED THEREIN

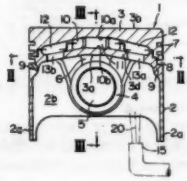
Mutsumi Kanda; Souichi Matsushita, and Kiyoshi Nakanishi, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 25, 1984, Ser. No. 623,934

Claims priority, application Japan, Mar. 14, 1984, 59-048824

Int. Cl.³ F01P *3/10*

U.S. Cl. 123—41.35 **8 Claims**



1. A piston for an internal combustion engine, comprising a crown portion having an axial outer end surface to be exposed to combustion gases and a generally hollow cylindrical side wall portion joining thereto to define a generally cup shaped structure having a piston inside space therein, said crown portion being formed with a hollow space therein for circulating lubricant therethrough thereby to cool said crown portion, said hollow space extending over a substantial portion of a transverse cross section of said crown portion and being defined by a first wall surface of a generally shallow concave conical shape on one axial side thereof closer to said axial outer end surface of said crown portion, thereby leaving a transverse wall portion which separates said hollow space from said piston inside space;

said crown portion further comprising a plurality of integrally formed ribs extending generally in an axial direction of said piston and in radial directions thereof, so as axially to transverse radially outside portions of said hollow space; said transverse wall portion being formed with at least one lubricant inlet opening and at least one lubricant outlet opening.

4,530,313

DRIVE ARRANGEMENT OF AN AUXILIARY DEVICE IN AN INTERNAL COMBUSTION ENGINE

Dieter Zaremba, Mühlacker, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jul. 3, 1984, Ser. No. 627,560

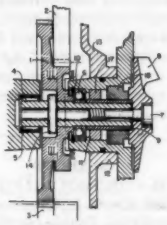
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1983, 3324327

Int. Cl.³ F01P *5/12*

U.S. Cl. 123—41.47 **11 Claims**

1. In an internal combustion engine having a housing wall, an auxiliary device mounted on the housing wall, and a drive wheel positioned on a first side of the housing wall,

a drive arrangement for driving the auxiliary device comprising a driven wheel positioned on a second side of the housing wall, a drive shaft supported by the housing wall,



and on which the drive wheel and driven wheel are mounted and centered, a lug means positioned on the first side of the housing wall for drivingly connecting the drive wheel to the drive shaft and a threaded connector means positioned on the second side of the housing wall for securing the drive shaft to the driven wheel.

4,530,314

WATER-COOLED TWO-CYLINDER TWO-STROKE INTERNAL COMBUSTION ENGINE

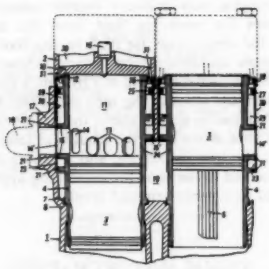
Gerhard Feichtinger, Graz, Austria, assignor to A V L Gesellschaft Für Verbrennungskraftmaschinen Und Messtechnik M.B.H., Graz, Austria

Filed Mar. 16, 1984, Ser. No. 590,568

Claims priority, application Austria, Mar. 29, 1983, 1115/83

Int. Cl.³ F02F *1/10*

U.S. Cl. 123—41.74 **1 Claim**



1. A water-cooled, two-cylinder, two-stroke internal combustion engine comprising, an engine housing having two cylinder liners defining cooling water chambers, said liners each having a thickened wall portion containing piston-controlled intake and exhaust ports, said intake ports being located on either side of said exhaust ports at front ends of the engine and being directed toward longitudinal side walls of the engine, said liners each having an unthickened wall portion devoid of any intake and exhaust ports, said unthickened wall portion of each said liner being adjacent one another at the center of the engine, the engine further comprising a thin-walled cooling jacket delimiting each of said cooling water chambers, each said jacket being attached in a leak-proof manner to each said thickened wall portion, each said jacket overlapping said exhaust ports of each said liner and having ports coinciding with said exhaust ports, said thickened wall portion of each said liner being further provided with open channels arounds said exhaust ports thereof and being covered by each said jacket and being in open communication with each said

cooling water chamber, and each of said cooling jackets, in the vicinity of said intake ports and at each said unthickened wall portion between said two cylinders, extending downwardly only to the upper edge of each said thickened wall portion and to a collar at the upper edge of each said unthickened wall portion at which each said cooling jacket is tightly sealed.

4,530,315

CYLINDER BLOCK

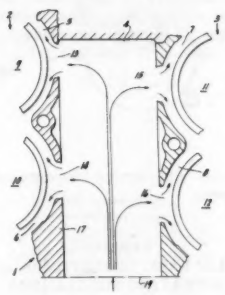
Hans Mezger, Freiberg, Fed. Rep. of Germany, assignor to Harley-Davidson Motor Co., Inc., Milwaukee, Wis.

Filed Jul. 13, 1984, Ser. No. 630,704

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1983, 3326317

Int. Cl.³ F01P *3/02*

U.S. Cl. 123—41.74 **3 Claims**



1. A one-piece die cast cylinder block for a water-cooled internal combustion engine having a crankshaft and which includes two rows of cylinders in a V arrangement, said block including a longitudinal duct for supplying the cooling water for said engine, said duct being connected to the coolant spaces of the cylinders which are located between a cylinder sleeve and an outer jacket part surrounding said sleeve, said longitudinal duct being disposed between the rows of cylinders of the cylinder block in the region of the coolant spaces for each cylinder, openings cast in a casing wall of said cylinder block, said openings being disposed directly adjacent the longitudinal duct and extending essentially radially to the cylinder, said longitudinal duct being disposed in a vertical longitudinal center plane of said cylinder block, said plane extending through the crankshaft axis of said engine, said longitudinal duct being trapezoidal in cross-section, the longer side of the trapezium being directed upwardly and the lateral faces of said trapezium of said duct extending approximately parallel to the axis of a corresponding cylinder, said longitudinal duct extending approximately as far as the rear cylinders of said engine of each row and wherein a cooling water pump is connected to the outer aperture of said duct.

4,530,316

ROTATING CYLINDER INTERNAL COMBUSTION ENGINE

Ronald D. Morrison, Sherwood Park, Canada, assignor to Morrison Motor Company, Alberta, Canada

Filed May 10, 1982, Ser. No. 376,695

Int. Cl.³ F02B *57/08*

U.S. Cl. 123—44 R **4 Claims**

1. In combination:

stationary frame means,

a stationary sun gear on the frame means,

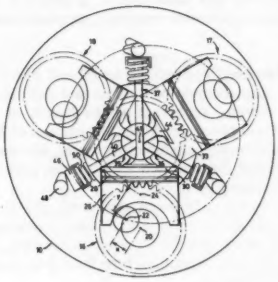
a rotary frame pivoted about the axis of the sun gear,

the rotary frame carrying three crankshafts at substantially 120° intervals,

for each crankshaft a cylinder in the rotary frame and a piston mounted for reciprocation in each cylinder, the axis of each cylinder being radial with respect to the axis of the sun gear, each piston lying between its respective crankshaft and the axis of the sun gear,

each crankshaft being fixed to rotate with a respective planetary gear, all planetary gears meshing with the sun gear and having the same pitch diameter as the sun gear, whereby any point on the pitch circle of a planetary gear describes a cardioid as the planetary gear rotates around the sun gear once,

the crankshaft eccentricity being substantially one-third of the pitch radius of a planetary gear, whereby each piston moves in a substantiallv circular orbit as the rotary frame turns,



each piston having a connecting link to its respective crank shaft,

fuel metering means for providing a combustible mixture for the cylinders,

ignition means to ignite the combustible mixture in each cylinder,

and valve means for admitting a combustible mixture to, and exhausting combustion gases from, each cylinder,

the valve means including, for each cylinder, an intake valve and an exhaust valve, each valve having its axis substantially intersecting the sun gear axis at a point intermediate the ends of the valve stem.

4,530,317

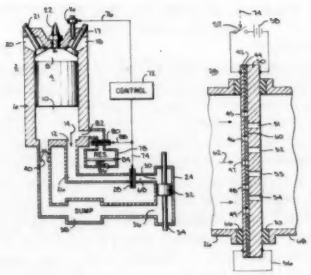
VARIABLE DISPLACEMENT FREE PISTON ENGINE

Herman P. Schutten, Milwaukee, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 20, 1984, Ser. No. 602,340

Int. Cl.³ F02B *71/00*

U.S. Cl. 123—46 R **4 Claims**



1. A variable displacement engine, comprising:

a free piston engine reciprocal in a cylinder between a combustion chamber and a fluid filled work chamber, said

work chamber having a work output port expelling fluid during a power stroke of said piston;

means for controllably supplying fuel to said combustion chamber;

an exhaust port in said combustion chamber;

a fluid motor operatively coupled to said work chamber and driven by fluid from said work output port;

valve means selectively actuatable to stop expulsion of fluid from said work output port to said fluid motor to halt movement of said piston during said power stroke, providing variable displacement of said piston according to actuation of said valve means; and

control means coupled to said valve means and said fuel supply means to coordinate the supplied fuel to the variable length power stroke of said piston as selectively controlled by said valve means, to afford a variable displacement engine with matching supplied fuel and power stroke;

wherein:

said variable length power stroke of said piston provides a variable displacement of fluid to said fluid motor in proportion thereto, such that as the length of said power stroke of said piston decreases, the amount of fuel supplied to said combustion chamber decreases, and the amount of fluid expelled through said work output port to said fluid motor decreases;

said valve means is between said work chamber and said fluid motor, and has a closed position blocking fluid flow from said work chamber to said fluid motor, and has an open position allowing fluid flow from said work chamber to said fluid motor;

said valve means comprises a high speed microporous, low mass, mechanical valve providing a marco-opening with micromovement, comprising:

a first planar sheet-like electrically conductive microporous film having an electrically insulative face surface on one side thereof, and an array of microapertures through said film and face surface;

a second planar sheet-like electrically conductive microporous film abutting said insulative face surface on the opposite side thereof from said first film, and having an array of microapertures through said second film nonaligned with said first mentioned array;

electric circuit means for supplying electric current flow through said first and second films to effect relative transverse movement therebetween due to interacting electromagnetic fields to open passages through said microapertures allowing transverse fluid flow through said films.

4,530,318

INTAKE AND EXHAUST VALVE SYSTEM FOR INTERNAL COMBUSTION ENGINE

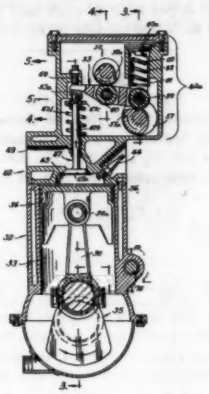
Harry F. Semple, Mt. Prospect, Ill., assignor to Carol M. Semple, Elk Grove Village, Ill.

Filed Jan. 20, 1984, Ser. No. 572,250

Int. Cl.³ F01L *1/34*

U.S. Cl. 123—90.17 **23 Claims**

1. In an internal combustion engine of the four-cycle spark or compression ignition type or the two-cycle compression ignition type having at least one cylinder with a piston reciprocable therein and connected to a crankshaft, a combustion chamber at one end of the cylinder coacting with the piston, at least one poppet-type valve for said combustion chamber, and a valve return spring continually biasing said valve into closed position, the improvement being in means for controlling the operation of said valve through opening and closing cycles in timed rélation to the crankshaft and for adjusting the timed relation which comprises, a floating valve operating rocker lever means in driving relation to said valve, said lever means having first and second cam followers, means restricting the lateral and longitudinal movement of said lever means, first and second camshafts driven from said crankshaft and having first and second cams for applying forces to said first and second cam followers, and drive means between both said camshafts and said crankshaft having means for adjusting said



timed relation so that optimum performance may be achieved for any engine speed.

4,530,319

HYDRAULIC LASH ADJUSTOR IN A VALVE OPERATING MECHANISM

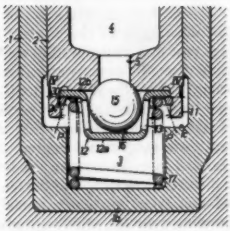
Shoichi Honda, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha and Nittan Valve Co., Ltd., both of Tokyo, Japan

Filed Aug. 1, 1983, Ser. No. 519,537

Claims priority, application Japan, Jul. 30, 1982, 57-133375

Int. Cl.³ F01L *1/24*

U.S. Cl. 123—90.46 **8 Claims**



1. In a hydraulic lash adjustor in a valve operating mechanism of the type including a cylinder, a plunger slidably fitted into said cylinder having a top end and a bottom portion having a lower end with a surface, a hydraulic chamber defined between both the cylinder and the plunger, a hydraulic oil reservoir chamber formed in the plunger, said hydraulic oil reservoir chamber being in communication with the hydraulic chamber by way of a valve bore which is formed in the lower end surface of the plunger, a check valve disposed so as to open said valve bore when hydraulic pressure in the hydraulic chamber decreases and close said valve bore when it increases, and a valve cage disposed on the lower end of the plunger and accommodating therein the check valve, the valve cage consisting of a cap-shaped main body and a flange portion integrally extending radially outward from a peripheral end part of said main body, wherein the plunger is biased by a resilient means as to project outwardly of the cylinder to support at its top end a rocker arm of the valve operating mechanism and

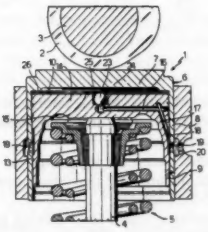
wherein valve opening force generated by an operating cam of the valve operating mechanism is transmitted to the plunger as a force depressing the plunger in an axial direction, the improvement wherein the lower end of the plunger has a cylindrical extension portion with an inner surface having an inner diameter, and the flange portion of the valve cage is firmly held in place between the lower end surface of the plunger and a holding member fitted into an annular engagement groove formed in the inner surface of the cylindrical extension portion of the plunger.

4,530,320

SELF ADJUSTING HYDRAULIC TAPPET FOR HEAT ENGINES

Daniele Ferrero, Vinovo, Italy, assignor to RIV-SKF Officine di Villar Perosa, SpA, Turin, Italy

Division of Ser. No. 303,053, Sep. 17, 1981, Pat. No. 4,424,774. This application Jan. 9, 1984, Ser. No. 569,512
Claims priority, application Italy, Nov. 21, 1980, 68785 A/80
Int. Cl.³ F01L *1/24*
U.S. Cl. 123—90.56 **8 Claims**



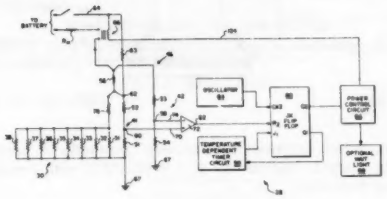
1. A self adjusting hydraulic tappet comprising a first open cup-shaped element (6) axially movable in a corresponding cylindrical seat formed in a cylinder head on an engine and having an upper end wall (7) cooperating with a cam and integral with a depending cylindrical side wall to define an cylindrical internal open area, a second-cup-shaped element housed inside said open area and axially slidable within the first element, said second element having an upper end wall (14) facing an inner surface of said upper end wall of said first element in order to define with this later a pressure chamber, the second element cooperating with a valve stem disposed within said cylindrical seat and immediately below the second element and at least one duct connecting to a fluid supply hole which passes through a side wall of the second element, a fluid supply opening in the first element aligned with said fluid supply hole, said fluid supply opening being connected to a pressurized fluid supply in the cylinder head, a one-way check valve at the other end of said duct and comprising a freely floating ball within a corresponding sealing seat cavity, the cavity being disposed in said upper end wall of said second element and open to and facing said inner surface of the end wall of the first element having a supply hole at its closed end to permit flow into said pressure chamber in response to higher pressure in the duct, the sealing cavity having a conical inner surface which defines the corresponding sealing seat of the ball the cavity being able to house substantially the whole ball, the supply hole having a substantially less diameter than that of the sealing seat, and said ball having a diameter which is both substantially greater than the diameter of the supply hole and substantially less than the upper width of the cavity so as to permit upward movement of the ball to allow fluid flow through the check valve and downward movement of the ball to engage the surface of the sealing cavity in sealing engagement when pressure is greater in the pressure chamber, the height of the pressure chamber being substantially less than the diameter of the ball in order to prevent the ball from escaping the sealing cavity.

4,530,321

GLOW PLUG CONTROL CIRCUIT

LaVerne A. Caron, Naperville, and Edward F. Handley, Clarendon Hills, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Jan. 12, 1984, Ser. No. 570,064
Int. Cl.³ F02N *17/00*
U.S. Cl. 123—179 H **49 Claims**



1. A method for controlling the rapid heating of one or more glow plugs which are energized by a power control circuit controlled by the output of a bi-stable multivibrator and an afterglow timer circuit and which are mounted in a diesel engine, comprising the steps of: causing the bi-stable multivibrator to output a logic high signal to cause the power control circuit to energize the plugs; comparing a voltage which is related to the resistance of the one or more glow plugs and which is altered by the heating up of the glow plugs subsequent to their initial energization by the power control circuit against a reference voltage which is a fixed percentage of supply voltage and which corresponds to a predetermined set temperature of the one or more glow plugs; supplying a control signal to the bi-stable multivibrator when the voltage related to the temperature of the one or more glow plugs is equal to said reference voltage (1) to reset the output of the multivibrator to a logic low to de-energize the power control circuit and (2) to initiate a timing out of the afterglow timer circuit; supplying a clock signal to the multivibrator to cause the multivibrator to re-energize the power control circuit to re-energize the glow plugs; timing out said timer circuit for a predetermined time period related to the ambient temperature while control signals and clock signals are being generated intermittently to heat the glow plugs until the time period has expired; and de-energizing the multivibrator after said time period.

2. In a glow plug control circuit including a four leg bridge circuit for controlling the energization of a bank of glow plugs the improvement residing in that one of the legs of said bridge circuit includes two series connected resistors which form a voltage divider and in that a bank of glow plugs is connected across at least one of said resistors such that the voltage at a junction between said resistors is a percentage of the voltage across the glow plugs.

4,530,322

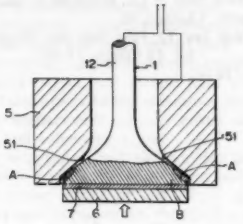
EXHAUST VALVE FOR DIESEL ENGINE AND PRODUCTION THEREOF

Takemi Yamada, Tokyo; Tamataro Satoh, Yokohama; Masaaki Mizushina, Fujisawa; Koji Toyota, and Hiromi Okamoto, both of Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1981, Ser. No. 315,666
Claims priority, application Japan, Oct. 31, 1980, 55-152264; Sep. 24, 1981, 56-149620
Int. Cl.³ F01L *3/02*
U.S. Cl. 123—188 AA **22 Claims**

1. Exhaust valve for Diesel engine, wherein a seat surface thereof is formed with at least one coated layer comprising ceramics and metals, the coated layer increasing substantially constantly in density of said ceramics towards an upper surface thereof.

2. Exhaust valve for Diesel engine, wherein a seat surface is formed with at least one coated layer comprising ceramics and



metals, which increases substantially constantly in ceramic density towards said surface and is provided with pressing-heating treatment.

4,530,323

CYLINDER HEAD STRUCTURE OF ENGINE

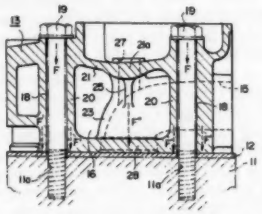
Akinori Wakasa, Hiroshima, Japan, assignor to Mazda Motor Corporation, Japan

Filed Dec. 20, 1983, Ser. No. 563,564

Claims priority, application Japan, Dec. 20, 1982, 57-192588[U]

Int. Cl.³ F01P *3/14*

U.S. Cl. 123—41.77 **7 Claims**



1. A structure of a cylinder head, having four corners, which is adapted to be mounted on a cylinder block for a multiple-cylinder in-line engine having a plurality of cylinder bores arranged in line and spaced from each other by interbore portions extending between a pair of opposed side portions of the cylinder block, said cylinder head having respective wall portions defining an intake port and an exhaust port for each cylinder bore of the cylinder block, said intake ports and said exhaust ports arranged in line parallel to said cylinder bores arranged in line, water jackets surrounding the intake ports and the exhaust ports, a cooling water passage provided between the water jackets surrounding the ports which are opposed to each other and spaced apart by said interbore portion, and a plurality of bolt holes for receiving head bolts for fixing the cylinder head to the cylinder block, the bolt holes being in the form of through-holes formed through boss portions disposed in said four corners and on said pair of opposed side portions of the cylinder head, the boss portions on the side portions corresponding to the interbore portions of the cylinder block, the upper portions of each pair of boss portions laterally opposed to each other along the corresponding interbore portion of the cylinder block being connected by a top deck having a central portion extending above the interbore portion of the cylinder block, the head bolts respectively passable through the cylinder head from above the top deck to secure the cylinder head to the cylinder block, wherein the improvement comprises that the central portion of each top deck is connected with at least one of the wall portions defining said intake port and the exhaust port on opposite sides of the top deck by way of a reinforcing rib, said at least one of the wall portions facing the interbore portion.

4,530,324

FUEL INJECTION PUMP FOR AN INTERNAL COMBUSTION ENGINE

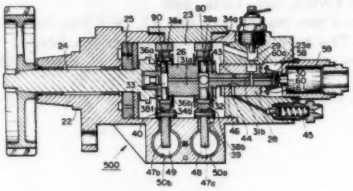
Toshiaki Tanaka, Chigasaki; Hiroaki Miyazaki, Kamakura; Yukihiro Etoh, Yokohama; Nobukazu Kanesaki, and Akihiro Iijima, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 30, 1983, Ser. No. 527,775

Claims priority, application Japan, Oct. 14, 1982, 57-180363

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—300 **10 Claims**



1. A fuel injection pump for an internal combustion engine having a rotatable crankshaft and a combustion chamber, the injection pump comprising:

(a) a first plunger pump for injecting fuel into the combustion chamber during first periodical compression strokes as the crankshaft rotates;

(b) a second plunger pump for injecting fuel into the combustion chamber during second periodical compression strokes as the crankshaft rotates, the maximum quantity of fuel injected by the second plunger during each of the second compression strokes being smaller than the maximum quantity of fuel injected by the first plunger pump during each of the first compression strokes;

(c) means for sensing load on the engine; and

(d) means, responsive to the sensed engine load, for advancing the timing of the first compression strokes relative to the timing of the second compression strokes with respect to the rotational angle of the crankshaft as the sensed engine load increases to vary the rate of the sum of the fuel injections effected by the first and second plunger pumps;

(e) whereby the characteristic curve of the rate of the sum of the fuel injections effected by the first and second plunger pumps with respect to the rotational angle of the crankshaft can vary in accordance with the engine load.

4,530,325

SUCTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Yuzuru Namba, and Kenichi Aoyagi, both of Hamamatsu, Japan, assignors to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan

Continuation of Ser. No. 302,230, Sep. 14, 1981, abandoned. This application Oct. 7, 1983, Ser. No. 540,101

Claims priority, application Japan, Nov. 13, 1980, 55-159715

Int. Cl.³ F02M *35/10*

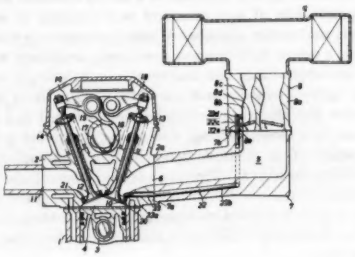
U.S. Cl. 123—308 **9 Claims**

5. An internal combustion engine comprising a carburetor, a manifold, and a cylinder head having a combustion chamber

wherein the combustion engine has a main suction path in fluid communication from the carburetor through the manifold to the combustion chamber; and

wherein said engine has a sub-suction path which is separate from the main suction path and is in fluid communication from the carburetor, through the intake manifold to the combustion chamber; and

wherein a swirling motion is imparted to a fuel-air mixture in the combustion chamber when a first portion of the fuel-air mixture flows into the combustion chamber from the main suction path and a second portion of the fuel-air mixture issues from the sub-suction path into the combustion chamber at approximately a right angle to the first portion of the fuel-air mixture; and



wherein the carburetor, the manifold, and the cylinder head have sub-suction path sections respectively such that these sections are placed in fluid communication with each other from the carburetor to the combustion chamber when the suction manifold is connected to the carburetor and to the cylinder head.

4,530,326

DEVICE FOR TRANSMITTING THE SET POINT OF A SET POINT ADJUSTER

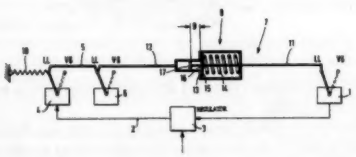
Arnold Mann, Bieber; Gerhard Ruschek, Hattersheim, and Reinhard Zenker, Frankfurt, all of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 21, 1984, Ser. No. 581,858

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1983, 3307968

Int. Cl.³ F02D *11/04*

U.S. Cl. 123—342 **9 Claims**



1. In a device for the transmission by electrical transmission means of the set point between an idling position and a full-gas position of an electrical set-point adjuster which is displaceable by the driver of a vehicle by means of a regulating unit, which adjuster controls the speed of travel of the vehicle by a control element which is displaceable in corresponding manner between an idling position and a full-gas position, and which adjuster is coupled with a control member which controls the fuel-air mixture of an internal combustion engine, the improvement comprising

a mechanical transmission element disposed between said set-point adjuster and either of said control element and said control member, said mechanical transmission element being couplable to the set-point adjuster for transmission of the position of said set-point adjuster to the control member, and

means responsive to the difference in position of said control member and the position of said set-point adjuster for disconnecting said transmission element from said set-point adjuster and/or said control element and/or said control member.

4,530,327

ELECTRIC CONTROL DEVICE FOR FUEL INJECTION PUMPS FOR INTERNAL COMBUSTION ENGINES

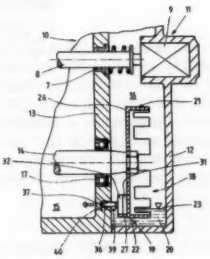
Martin Böhm, Stuttgart; Manfred Krämer, Schwieberdingen, and Reinhard Schwartz, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 14, 1983, Ser. No. 513,563

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1982, 3228513; Mar. 15, 1983, 3309181

Int. Cl.³ F02M *59/00*

U.S. Cl. 123—357 **15 Claims**



1. An electric control device for a fuel injection pump for internal combustion engines, in particular an electric final control element having at least one adjusting member located in a housing of said control element acting upon a regulating rod of said fuel injection pump, the improvement comprising a suction means disposed in said housing for aspirating excess lubricant in said housing originating from said injection pump back to said injection pump, wherein said suction means comprises a rotating part having at least one circumferential section contacting the excess lubricant in a sump of the interior of said housing, wherein said suction means, in the vicinity of said circumferential section of said rotating part, dips into said sump at approximately the lowest point on the circumference and has a gap formed by an outer surface of said rotating part on the one side and by a stationary surface element on the other, said gap communicates via a discharge conduit with the interior of said injection pump and is open in the circumferential direction of said rotating part at the opposite end toward said sump, wherein said surface element comprises a sliding shoe means resting on an end face of said rotating part, said sliding shoe means containing said gap, and wherein said sliding shoe means is displaceably guided in a direction approximately at right angles to said end face of said rotating part and is pressed by means of a pressure spring against said end face.

4,530,328

IGNITION TIMING CONTROLLER FOR INTERNAL COMBUSTION ENGINE

Satoshi Komurasaki, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Apr. 11, 1983, Ser. No. 483,699

Claims priority, application Japan, Apr. 15, 1982, 57-64404; Apr. 15, 1982, 57-64405

Int. Cl.³ F02P *5/04*

U.S. Cl. 123—425 **7 Claims**

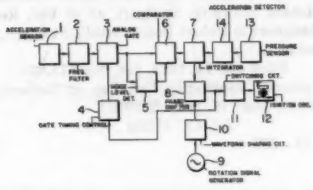
1. An ignition timing controller for an internal combustion enging having an ignition coil comprising:

an acceleration detector for detecting the acceleration of the engine from normal operation and producing an acceleration operation representing signal including a sensor for detecting the vibration of the engine;

means for deriving a knocking signal component by removing a noise signal component from the output of said vibration sensor;

means for generating a reference ignition timing signal;

phase shifting means actuated responsive to the knocking signal for varying the phase of said reference ignition timing signal;



means responsive to said acceleration operation representing signal for variably adjusting the maximum value of the displacement of phase of the reference ignition timing signal by said phase shifting means during any change between normal operation and acceleration operation; and

means for energizing said ignition coil including switching means for interrupting the energization of said ignition coil according to the phase of said timing signal.

4,530,329

FUEL INJECTION SYSTEM

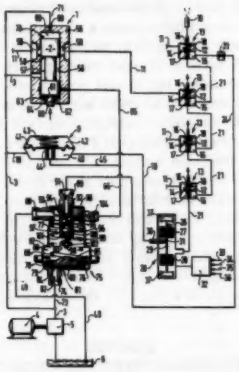
Wolfgang Maisch, Schwieberdingen; Hermann Nusser, Markgröningen; Klaus-Jürgen Peters, Affalterbach, and Willi Strohl, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 19, 1983, Ser. No. 543,653

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1982, 3248259; Apr. 22, 1983, 3314633

Int. Cl.[3] **F02M** *69/00;* **F02D** *3/02*

U.S. Cl. 123—447 **10 Claims**



1. A fuel injection system for internal combustion engines comprising a fuel metering valve located in a fuel supply line, said fuel metering valve including a metering sheath; a plurality of fuel control openings in said metering sheath which are variable in common by a movable control slide displaceable in a sliding bore of said sheath, said control slide including an annular control groove, supply means directing fuel pressure on one end of said control slide and in an area of said annular control groove, a plurality of regulating valves downstream of said fuel metering valve one regulating valve for each said fuel control opening in said metering sheath fuel pressure directed from each said fuel control opening to one side of a movable regulating valve element of each of said regulating valves, each said regulating valve element being subjected to a fuel pressure in a differential pressure control line prevailing on a side opposite to a pressure directed from each said fuel control opening, a fuel reservoir located on the fuel supply line, said fuel reservoir including a yielding reservoir wall including on one side thereof a reservoir chamber, a fuel pressure in the fuel supply line acting one one side of said yielding reservoir wall and a reservoir spring disposed in a spring chamber acting on an opposite side of said reservoir wall counter to said fuel pressure, said spring chamber of said fuel reservoir communicates via a return flow line to a fuel supply container, a sealing valve operable within said fuel reservoir including a movable sealing valve element, said movable sealing valve element protrudes into said spring chamber and is urged in a closing direction by a closing spring, said sealing valve being located at a mouth of an outflow line, which communicates via a control throttle with a differential pressure control line via said regulating valves wherein said sealing valve element is movable by a predetermined movement of said yielding reservoir wall into the spring chamber in the opening direction of said sealing valve.

4,530,330

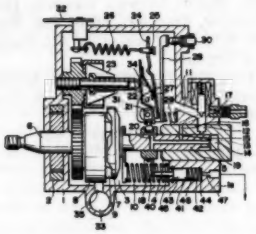
DISTRIBUTION TYPE FUEL INJECTION PUMP

Toru Sakuranaka, and Hachiro Aoki, both of Higashi-Matsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1983, Ser. No. 546,305

Int. Cl.[3] **F02M** *41/00*

U.S. Cl. 123—449 **8 Claims**



1. In a distribution type fuel injection pump means having:

a fuel feed pump,

a chamber to which fuel is supplied by said fuel feed pump and in which the fuel pressure is according to the engine r.p.m.,

a plunger which reciprocates and rotates simultaneously and carries out suction and subsequent pressure feeding of the fuel from said chamber and distributes it, said plunger having a cutoff port opening out of said plunger,

a control sleeve shiftably mounted on said plunger for sliding movement therealong to cover and uncover said cutoff port for changing the time of opening the cutoff port for increasing or decreasing the amount of fuel fed, and

regulating means connected to said control sleeve for adjusting the position of said control sleeve according to the engine r.p.m. and the accelerator position for providing a predetermined excess fuel starting characteristic,

the improvement comprising:

an engaging member on said control sleeve; and

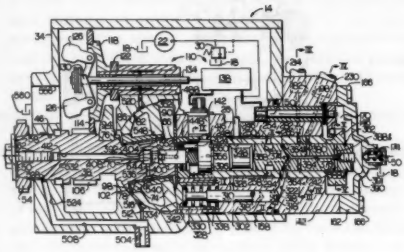
a delay means on said pump means abuttable by said engaging member when said control sleeve is moved in the direction for increasing the fuel pumped by said plunger for delaying the shifting of said control sleeve in said fuel increasing direction.

4,530,331

THRUST AND PLANETARY GEAR COUPLING FOR A ROTOR OF A DISTRIBUTOR FUEL INJECTION PUMP

Dennis H. Gibson, Edelstein, and Alan R. Stockner, Chillicothe, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 27, 1984, Ser. No. 593,990
Int. Cl.[3] F02M *41/06*
U.S. Cl. 123—450 6 Claims



1. A thrust and planetary gear coupling for a distributor fuel injection pump having a pumping element and a housing which supports a rotatable drive shaft to drive the pumping element comprising:

a distributor rotor adapted during operation to sequentially communicate pressurized fuel from the pumping element to more than one combustion cylinder of an engine, said distributor rotor adapted during operation to be axially fixed and rotatively disposed in the housing;

a planetary gear reduction mechanism adapted for drivingly interconnecting said distributor rotor with the drive shaft to rotate said distributor rotor at a preselected output angular speed which is proportional to and less than a preselected input angular speed of the drive shaft, said planetary gear reduction mechanism including a rotatable sun-gear shaft adapted to be driven by the drive shaft at the same input angular speed, a normally stationary internally-toothed ring gear positioned in concentrically spaced relation around the sun-gear shaft, and a rotatable planet gear and carrier assembly which meshes radially between the sun-gear shaft and the ring gear and which is adapted during operation to rotate the distributor rotor at the same output angular speed; and

a dual-thrust plate adapted to be releasably fastened to the housing and having a bore through which the sun-gear shaft extends to mesh with the planet gear and carrier assembly, said dual-thrust plate having a pair of oppositely facing thrust-bearing surfaces wherein one of the thrust-bearing surfaces is adapted to directly face and control one direction of axial end play of the drive shaft and wherein the other of said thrust-bearing surfaces retains and during operation is adapted to be beared against by a proximate end portion of said planet gear and carrier gear assembly and controls one direction of axial end play of the distributor rotor.

4,530,332

FUEL CONTROL SYSTEM FOR ACTUATING INJECTION MEANS FOR CONTROLLING SMALL FUEL FLOWS

Bruce J. Harvey, Sterling Heights, Mich.; Harold J. Laurent, Newport News, and Michael A. Pauwels, Williamsburg, both of Va., assignors to Allied Corporation, Morristown, N.J.

Filed Oct. 26, 1983, Ser. No. 545,792
Int. Cl.[3] F02D *5/02*
U.S. Cl. 123—481 10 Claims

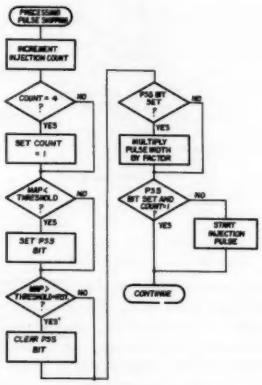
1. A fuel control system for actuating injection means for controlling small fuel flows in a fuel injected engine having a plurality of cylinders comprising;

signal generating means responsive to a fuel demand condition of the engine for generating a demand signal proportional to the amount of fuel demanded by the engine;

fuel pulse generating means responsive to said demand signal for generating fuel pulses for activating the injection means in a predetermined order of cylinder injection during each engine cycle according to the demands of the engine, said fuel pulses having a time width proportional to the amount of fuel to be injected into the engine;

threshold means for generating a threshold signal indicating a small fuel flow demand for the engine;

comparison means responsive to said demand signal and said threshold signal and operative for generating a pulse skipping signal when said demand signal is less than said threshold signal;



counter means for counting said fuel pulses, said counter means operative to count to a predetermined number and reset said counter means to a beginning count value;

means responsive to said beginning count value and said pulse skipping signal for generating a pulse skipping signal; and

injection actuation means responsive to said fuel pulses and the absence of said pulse skipping signal for actuating the injection means and in the presence of said pulse skipping signal to skip actuating the injection means at a different time during each engine cycle in a predetermined order of skipping, opposite to said predetermined order of cylinder injection.

4,530,333

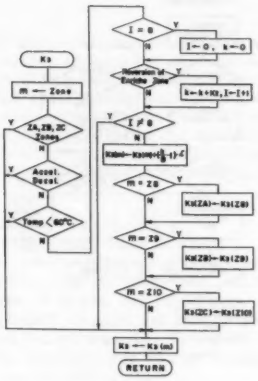
AUTOMOBILE FUEL CONTROL SYSTEM

Hirofumi Nishimura, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima and Mitsubhish Denki Kabushiki Kaisha, Tokyo, both of, Japan

Filed Sep. 13, 1983, Ser. No. 531,683
Claims priority, application Japan, Sep. 20, 1982, 57-164698
Int. Cl.[3] F02D *5/00*
U.S. Cl. 123—489 6 Claims

1. A fuel control system for an automobile engine which comprises an air-fuel ratio detector for detecting the air-fuel ratio of a combustible mixture to be supplied to the engine; an engine rotational speed detector for detecting the engine rotational speed; an engine load detector for detecting the engine load imposed on the engine; a first storage means storing, at address locations determined by respective combinations of engine rotational speed and engine load, a standard control value for the control of the amount of fuel to be supplied during a particular engine operating condition; a second storage means storing, for each of a plurality of zones defined by the engine rotational speed and the engine load, a correction

control value for the correction of the standard control value; a control signal output means for, when the engine is operating under a high load condition with the engine load being higher than a predetermined value, outputting, as the control value of a control signal, a control value given by the first and second storage means to an engine operating condition then assumed by the engine and, when the engine is operating under a condition with the engine load being consequently lower than the predetermined value, for correcting the control value given by the first and second storage means to the engine operating condition then assumed by the engine, in such a manner, that the air-fuel ratio of the combustible mixture is rendered to settle within a predetermined value on the basis of an output from the air-fuel ratio detector, and outputting the finally corrected control value as the control value of the control signal; a correction control value modifying means for, during



the engine operating condition other than the high load operation condition, modifying on the basis of the control value of the control signal from the control signal output means the correction control value stored in the second storage means and aassociated with a first zone in which the engine is then operating, so that the air-fuel ratio of the combustible mixture to be controlled by the control value given by the first and second storage means can attain the predetermined value, and for modifying, on the basis of the correction control value for said first zone, the correction control value that is stored in the second storage means at a second zone corresponding to the high load engine operating condition at the same engine rotational speed as in said first zone; and a fuel supplying means adapted to receive the control signal from the control signal output means for controlling the flow of fuel to be supplied to the engine.

4,530,334

AIR FLOW METERING

Brian C. Pagdin, Dunstable, England, assignor to Solex (U.K.) Limited, London, England

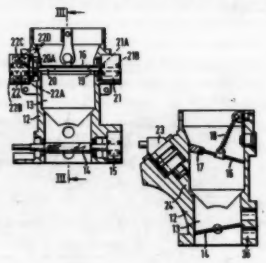
Filed Nov. 28, 1983, Ser. No. 555,482

Claims priority, application United Kingdom, Dec. 9, 1982, 8235118

Int. Cl.³ G01F *1/28*; F02M *51/00*

U.S. Cl. 123—494 **8 Claims**

1. Air flow metering means adapted to measure air flow to an inlet manifold of an internal combustion engine, comprising a body forming an air flow passage for the air flow to be metered, a flap which is supported for pivotal movement within the passage about an axis a central portion of which is offset from both the longitudinal axis and the walls of the passage, the flap being supported by rotary low friction bearings mounted on the body and being dynamically balanced, the whole of the flap being located within the path of the air flow to be metered throughout its range of pivotal movement within the passage, resilient biassing means which act substantially at the centre of area of the flap whereby to urge the flap into a position in which it extends across and substantially closes the passage and which act on the flap in opposition to the fluid pressure loading on the flap due to air flow through the pas-



sage, low friction damping means operable to damp pivotal movement of the flap without substantially increasing the inertia of the moving parts of the air flow metering means, and sensing means operatively associated with the flap without loading it significantly and operable to emit an output signal which is a measure of the angular position of the flap within the passage and thus is a measure of air flow through the passage.

4,530,335

IN-LINE TYPE FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

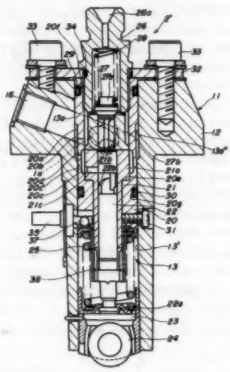
Keizi Torizuka, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jun. 28, 1983, Ser. No. 508,899

Claims priority, application Japan, Jul. 6, 1982, 57-102125[U]

Int. Cl.³ F02M *59/44*

U.S. Cl. 123—495 **9 Claims**



1. An in-line type fuel injection pump comprising:

a pump housing having a plurality of pump accommodating spaces formed therein and arranged in a line, said pump accommodating spaces each having an inner peripheral surface, and a plurality of partition wall portions formed in said pump housing and separating adjacent ones of said pump accommodating spaces from each other, said pump housing having an outer wall surface;

a plurality of pump assemblies accommodated, respectively, in said pump accommodating spaces, said pump assemblies each including a plunger barrel mounted within a

corresponding one of said pump accommodating spaces, and a plunger disposed for reciprocating motion within said plunger barrel for pressure delivery of fuel; and

a plurality of fuel passaages formed in said pump housing, said fuel passages extending from said outer wall surfaces of said pump housing to respective ones of said partition wall portions, each of said fuel passages having an interior diameter larger than the width of a corresponding one of said partition wall portions, said fuel passages each having an inner end terminating in both of said inner peripheral wall surfaces of said two adjacent ones of said pump accommodating spaces at predetermined regions to thus communicate them with each other, and said fuel passages having an outer end terminating in said outer wall surface of said pump housing;

said outer wall surface of said pump housing including two opposite side surfaces of said pump housing; and

said fuel passages including at least one first fuel passage extending in said pump housing from one of said opposite side surfaces of said pump housing to a corresponding one of said partition wall portions, and at least one second fuel passage extending in said pump housing from the other of said opposite side surfaces of said pump housing to another corresponding one of said partition wall portions.

4,530,336
INJECTION TIMING CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINE

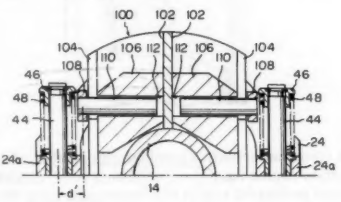
Toshio Ichinose, Sayama, Japan, assignor to Diesel Kiki Company, Ltd., Tokyo, Japan

Filed Oct. 17, 1983, Ser. No. 542,823

Claims priority, application Japan, Oct. 29, 1982, 57-163952[U]

Int. Cl.³ F02M *59/20, 59/32*

U.S. Cl. 123—502 **2 Claims**



1. A hydraulically operated injection timing control device for an internal combustion engine in which a first member is connected to one of the engine and a fuel injection pump associated with the engine, and a second member including a shaft connected to the other, said device comprising:

a cam assembly operatively connecting the first and second members to each other;

a hydraulic actuator for actuating the cam assembly;

connector means for operatively connecting the hydraulic actuator to the cam assembly, the hydraulic actuator controllably urging the connector means on and along a first line of action in response to a hydraulic fluid pressure communicated thereto; and

returning means for returning the connector means on and along a second line of action which is parallel to and opposite in direction to the first line of action;

said first and second lines of action commonly lying in a plane which is perpendicular to an axis of the shaft of the second member and contains an axis of the hydraulic actuator therein;

the connector means comprising a generally U-shaped connector plate, said plane being parallel to said connector plate;

the connector means further comprising a bracket extending from the connector plate perpendicularly thereto;

the connector means yet further comprising a pin rigidly carried at one end thereof by the bracket and having an axis perpendicular to the second line of action, said first line of action being defined by a point of connection between the bracket and the pin.

4,530,337
FUEL INJECTION PUMP

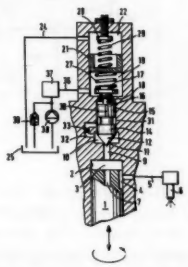
Helmut Laufer, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 1, 1983, Ser. No. 556,816

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1983, 3300876

Int. Cl.³ F02M *37/04*

U.S. Cl. 123—506 **20 Claims**



1. A fuel injection pump comprising at least one pump piston and a pump work chamber defined by said piston, a withdrawal chamber connected with said work chamber in order to influence a course of fuel injection at a fuel injection line supplied by said work chamber, said fuel withdrawal chamber being defined by a first movable wall which on the side remote from said fuel withdrawal chamber is loaded by a restoring means comprising a restoring spring towards an abutment of said first movable wall, said restoring means being provided in a restoring chamber, and simultaneously acting upon a second movable wall defining said restoring chamber, a variable pressure medium, said second movable wall being subjected to a variable pressure of said variable pressure medium, the position of said second movable wall relative to said abutment of said first movable wall is varied over the entire operating range of the fuel injection pump in counterbalance of forces resulting from said restoring sring and said varying pressure of said variable pressure medium and thereby controlling the restoring force of said restoring means acting upon said first movable wall.

4,530,338
SUPERCHARGER FOR AN ENGINE WITH AN ENGINE-POWERED AUXILIARY DEVICE

Yasuo Sumi, Zushi, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 24, 1983, Ser. No. 469,415

Claims priority, application Japan, Mar. 26, 1982, 57-42662[U]

Int. Cl.³ F02B *33/36*

U.S. Cl. 123—559 **2 Claims**

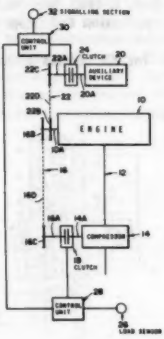
1. A supercharger for the combination of an engine, an air intake passage through which air is conducted to the engine, and an auxiliary device connectable to the engine to be driven by the engine; comprising:

(a) a compressor disposed in the air intake passage for compressing air conducted to the engine, the compressor being connectable to the engine to be driven by the engine;

(b) first means for sensing whether or not the power output required of the engine is higher than a predetermined level;

(c) second means responsive to the first means for disconnecting the compressor from the engine when the power output required of the engine is not higher than the predetermined level;

(d) third means responsive to the first means for disconnecting the auxiliary device from the engine when the power output required of the engine is higher than the predetermined level;



(e) fourth means for sensing whether or not the pressure in the air intake passage downstream of the compressor is higher than a predetermined value; and

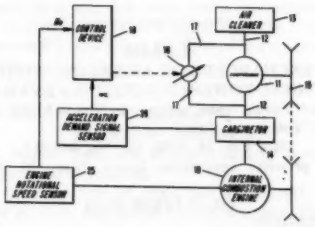
(f) fifth means, being responsive to the fourth means, for disabling the disconnection of the auxiliary device from the engine by the third means and thus establishing the connection of the auxiliary device to the engine when the pressure in the air intake passage downstream of the compressor is higher than the predetermined value.

4,530,339

SUPERCHARGER CONTROL APPARATUS FOR MOTOR VEHICLES

Tomio Oguma, Anjo, and Seiji Hayakawa, Nagoya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Mar. 30, 1983, Ser. No. 480,351
Claims priority, application Japan, Mar. 31, 1982, 57-52920
Int. Cl.³ F02D *23/00*
U.S. Cl. 123—561 **5 Claims**



1. In a motor vehicle's internal combustion engine having an air duct to provide air to an intake manifold of said engine, a supercharger control apparatus comprising:

a compressor driven by the output torque of said engine for providing supercharged air flow into the intake manifold of said engine;

means associated with said engine for sensing the rotational speed of said engine and for producing a first signal representing said rotational speed;

means associated with said engine for sensing the demand for vehicle acceleration and for producing a second signal representing said acceleration demand; and

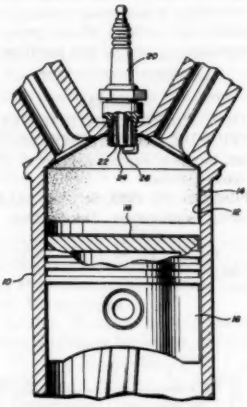
means associated with said intake manifold for controlling the amount of said air flow into said manifold to regulate the supercharging of said engine in accordance with the driving states of the motor vehicle as determined by said first and second signals, wherein the control means provides, at predetermined ranges of said signals, non-supercharging, intermediate supercharging the degree of which changes in incremental steps to prohibit hunting, or maximum supercharging.

4,530,340

ACID CATALYZED COMBUSTION

Millard C. Totman, 1524 Rosewood Way, Colusa, Calif. 95932

Filed May 1, 1981, Ser. No. 259,491
Int. Cl.³ F02B *77/02*
U.S. Cl. 123—669 **18 Claims**



1. In combination with a combustion chamber of an internal combustion engine having a combustion zone, catalytic cracking means positioned within the combustion zone for converting heavy hydrocarbon fuel molecules charged into the combustion chamber into a combustible mixture of lighter and more volatile hydrocarbon carbon fuel molecules, said catalytic cracking means comprising an acid catalyst applied as a coating on surfaces of said combustion zone not subject to mechanical abrasions.

4,530,341

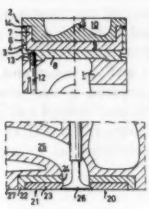
PISTON ENGINE HAVING AT LEAST ONE HEAT-INSULATED COMBUSTION CHAMBER, AND PARTS FOR SAID ENGINE

Bengt N. J. Palm, Nykvarn, Sweden, assignor to Saab-Scania Aktiebolag, Sodertalje, Sweden

Continuation of Ser. No. 198,066, Oct. 17, 1980, abandoned. This application Jul. 22, 1983, Ser. No. 516,189
Claims priority, application Sweden, Oct. 22, 1979, 7908739
Int. Cl.³ F02B *75/08*
U.S. Cl. 123—669 **9 Claims**

1. A piston engine having at least one cylindrical combustion chamber having a cylinder axis, said combustion chamber being limited by at least one wall portion comprising a support body with at least one mantle surface radially directed relative to the cylinder axis, said surface facing a corresponding radially directed surface on a heat resistant body limiting the combustion chamber; and a heat-insulating and force-transmitting substantially cylindrical cup disposed between the heat-resistant body and the support body and fully separating said bodies

from any contact, said cup having a recess with a bottom wall having surfaces which face axially relative to said cylinder axis and a substantially cylindrical side wall having radially directed surfaces in engagement with the radially directed surface on said support body and with the radially directed surface on said heat-resistant body, said cup being of a material of



low coefficient of thermal expansion and a low modulus of elasticity relative to the material of said heat-resistant body and to the material of said support body, said bodies and said cup being held together only by radial clamping forces acting at said radially directed surfaces with the heat-resistant body being contained within said recess.

4,530,342

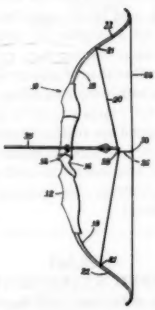
ARCHERY BOW

Miroslav A. Simo, 370 N. Delaplaine Rd., Riverside, Ill. 60546

Filed Oct. 11, 1983, Ser. No. 540,633

Int. Cl.³ F41B *5/00*

U.S. Cl. 124—24 R **22 Claims**



1. In an archery bow of the type having an elongated rigid central riser portion with energy storage means attached to opposite end portions and an arrow engaging and propelling bowstring attached to said energy storage means, the improvement comprising; a primary energy storage means having said propelling bowstring attached thereto at opposite ends; bow limbs extending outwardly from each opposite end of said riser having a draw bowstring attached thereto at opposite ends, said draw bowstring and said bow limbs defining a shape larger than the shape defined by said propelling bowstring and said primary energy storage means; and a force transmitting bridge means in draw force communication between a predetermined attached position on said propelling bowstring and a predetermined attached position said draw bowstring whereby when a draw force is applied by a user to said draw bowstring said draw force is transmitted to said propelling bowstring only at said predetermined attached position on said propelling bowstring, so as to provide a force for launching an arrow engaging said propelling bowstring.

4,530,343

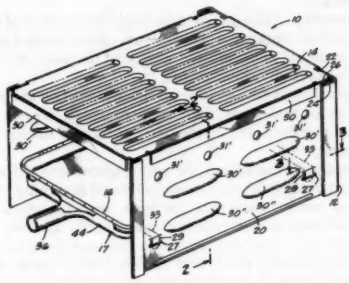
DISPOSABLE BARBEQUE ASSEMBLY

Paul Beck, 1100 N. Alta Loma Rd., Los Angeles, Calif. 90069

Continuation-in-part of Ser. No. 465,785, Feb. 11, 1983, abandoned. This application May 25, 1984, Ser. No. 614,128

Int. Cl.³ F24C *1/16*

U.S. Cl. 126—9 A **6 Claims**



1. A U-shaped frame having a pair of side panels and an end panel, means for detachably securing said side panels to said end panel, a disposable grill adapted to be suppoted by said frame, a first pair of lateral support surfaces integrally formed with and defined by said side panels and extending inwardly of said frame with respect to said side panels, a fuel pan carrying member including a handle portion and a U-shaped pan support portion and defining a pair of lateral horizontal pan support surfaces, a transverse horizontal pan support surface spanning said lateral surfaces and wall portions extending upwardly from said lateral and transverse support surfaces for securing said pan on said member.

4,530,344

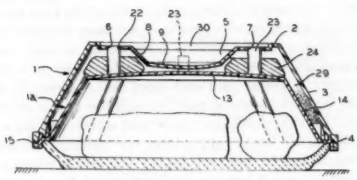
HEAT-RADIATING COVER FOR FOOD PLATES

Mike Iyengar, Chicago, Ill., and Gail Gallagher, San Clemente, Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Jul. 28, 1983, Ser. No. 518,174

Int. Cl.³ A47G *23/04;* B65D *21/02, 6/10*

U.S. Cl. 126—246 **5 Claims**



1. A heat-radiating cover for food plates comprising:

an outer shell of plastic material joined at its periphery to the periphery of an inner shell of plastic material, said inner shell having a shape complementary to said outer shell;

said inner shell fitting within said outer shell to define a space therebetween, and said joined shells having a size and shape sufficient to cover a food plate and a downwardly projecting flange disposed on the outer edge of the peripheral rim thereof for engaging the outer portion of a food holding plate and for minimizing escape of heat therefrom;

said outer shell having a cavity in the central portion of the top thereof, a handle extending across said cavity, and a means for attaching the handle to the outer surface at its

top, said cavity having a size and shape sufficient to permit a hand to pass beneath said handle;

a means for absorbing and radiating heat disposed in contact with the top surface of said inner shell and within the space between said outer and inner shells;

a post means disposed on the top surface of said inner shell and projecting upwardly through said heat absorbing means for engaging and holding said heat absorbing means;

a plurality of ribs disposed on the lower surface of said inner shell so that two or more covers can be stacked and heated air directly contacts the surface of the inner shell adjacent the heat absorbing means;

a plurality of spaced projections disposed on the peripheral rim of said inner shell and projecting downwardly for seating the cover on the outer portion of the food holding plate; and

a means for insulating the entire space between said inner and outer shells not occupied by said absorbing and radiating means, such that the heat from the absorbing and radiating means radiates downwardly directly through said inner shell into the space between the cover and the food holding plate, and the insulating means minimizes absorption or radiation of heat outwardly through said outer shell.

4,530,345

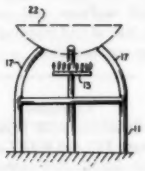
STOVE FOR ROUND BOTTOM VESSELS

Jens H. Christiansen, 1825 State St., Santa Barbara, Calif. 93101

Filed Feb. 28, 1980, Ser. No. 125,338

Int. Cl.³ F24C *3/08*

U.S. Cl. 126—40 **2 Claims**



1. A stove for chinese wok cooking vessels comprising

(a) a source of heat having a vertical axis; and

(b) at least three upright supports each having an upper end face, said supports being spaced about the heat source and having curvilinear upper end sections inclined towards each other, said supports terminating at said end faces whose upper peripheral edge regions are in a generally horizontal plane, said end faces being generally equidistant from the vertical axis through the center of said heat source, said curvilinear upper end sections of the supports being at an angle approximately midway between the vertical axis of said heat source and said horizontal plane;

whereby a round bottom cooking vessel has at least three support contacts when placed over the heat source and upon said upper end faces.

4,530,346

MECHANICAL THERMOSTAT HAVING PROPORTIONAL CONTROL FOR A SOLID FUEL-BURNING STOVE

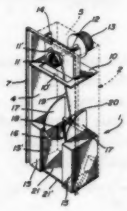
Claude Roy, 2075, 125th St., Saint-Georges de Beauce, Province of Quebec, Canada G5Y 2Y5

Filed Jun. 12, 1984, Ser. No. 619,731

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—77 **4 Claims**

1. A mechanical thermostat for a solid fuel burning stove, comprising: an elongated casing having a front wall, side walls, a top wall, a bottom wall and an open rear side and adapted to be secured to the outer surface of a vertical wall plate of said stove in generally vertical position and with its side walls abutting said wall plate, said casing further having a partition extending therein defining an upper casing portion and a lower casing portion, said lower casing portion adapted to register with an aperture made in said wall plate for air admission within said stove; a coil thermostat of the bi-metal type mounted in said upper casing portion, manually-operable adjusting means for said coil thermostat disposed at the exterior of said front wall, said adjusting means including a transverse control rod rotatably mounted in said upper casing portion and having an inner end and an outer end, said coil thermostat having an inner end secured to said inner end of said control rod, said outer end of said control rod projecting out of said casing front wall and being fitted with an adjustment knob; said lower casing portion including an air admission means to con-



trollably direct combustion air through said casing and through said aperture into said stove; said air admission means including two similar compartments laterally spaced apart and mounted within said lower casing portion, each compartment having a top wall and open at its bottom to the exterior of said casing, said two compartments further having individually-facing inner walls; both said inner walls being formed with an orifice in the shape of a quarter of circle; variable closure means for said orifices including two rigid sector plates, of slightly longer radius than that of said orifices and mounted on a casing supported width-wise extending pivot rod at either end thereof, said sector plates pivotally slidable over the respective orifices between an orifice-opening position and an orifice-closing position; and linkage means for connecting the outer end of said coil thermostat to said pivot rod, whereby said coil thermostat controls the opening and closing movement of said sector plates.

4,530,347

GAS-FIRED WATER HEATERS

Michael J. Baker, Birmingham, and Geoffrey J. Hardwick, London, both of England, assignors to British Gas Corporation, London, England

Filed Aug. 17, 1984, Ser. No. 641,585

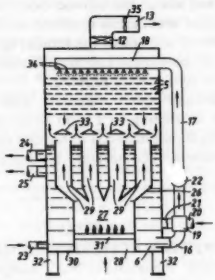
Claims priority, application United Kingdom, Oct. 14, 1983, 8327627

Int. Cl.³ F24H *1/20*

U.S. Cl. 126—360 R **11 Claims**

1. A compact, gas-fired water heater which comprises a casing that has an upper portion and a lower portion, said lower portion providing a reservoir for containing water; a water distribution means positioned within said casing at a location above said reservoir, said water distribution means being capable of discharging streams of water towards said reservoir; a feed water inlet means extending into said casing for supplying feed water to said water distribution means; a heat exchanger positioned within the reservoir of said casing, said heat exchanger being capable of receiving heat combustion gases and transferring the heat therein to water in the reservoir of said casing; a first gas outlet means connected to the heat exchanger for discharging the combustion gases therein upwardly towards said water distribution means; heat

transfer means positioned within said casing between said reservoir and said water distribution means for enabling heat transfer between the combustion gases emitted by said first gas outlet means and the water streams falling from said water



distribution means, said heat transfer means comprising a plurality of plates that are horizontally positioned one above another, each of said plates having a predetermined number and size of apertures; and a second gas outlet means connected to the upper portion of said casing.

4,530,348

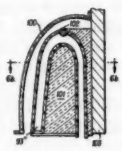
SOLAR COLLECTOR SYSTEM FOR HEATING FLUIDS

Martin H. Kaufman, Box 243, Ridgecrest, Calif. 93555

Continuation-in-part of Ser. No. 1,442, Feb. 2, 1979, abandoned, which is a continuation-in-part of Ser. No. 177,384, Aug. 12, 1980, abandoned. This application Mar. 25, 1983, Ser. No. 478,668

Int. Cl.[3] **F24J** *3/02*

U.S. Cl. 126—444 **15 Claims**



1. A solar heating device for heating a fluid comprising a solar absorber composed of concentric arclike layers having radii and an abutting face with a midpoint such that the abutting face defines two chords at its midpoint, one subtending the outer layer which absorbs solar radiation and the other subtending the inner layer, both chords much smaller than the radii of said layers, the difference between said radii being much smaller than the smallest of said chords, said difference defining a space between said layers, said space having at least one entrance, at least one exit and an apex, so that said fluid enters through said entrance and travels through said space and rises to said apex and exits through said exit, and wherein said absorber is fabricated substantially from polymeric material compounded with additives whose thermal conductivities are higher than the thermal conductivity of said polymeric material, and said additives exhibit high absorptivity of solar radiation.

4,530,349

THERAPY AID FOR TREATING CYSTIC FIBROSIS

Dorothy Metzger, 4412 Cathey Cir., Peoria, Ill. 61615

Filed Dec. 6, 1983, Ser. No. 558,621

Int. Cl.[3] **A61K** *39/00*

U.S. Cl. 128—1 R **10 Claims**

7. A cystic fibrosis vest made of quilted material having batting positioned between two layers of cloth, said vest being located externally in the area above the thoracic cavity, said batting providing a sufficient amount of padding which is appropriate to treat a cystic fibrosis patient, a plurality of patches sewn over said vest at preselected locations for adding incremental amounts of padding to said general padding, means for individually identifying each of said patches to establish a sequence for clapping the body of a patient, means associated with each of said patches for indicating a posture for the body while it is clapped at the location of the patch, and means for fastening the vest around the body of the patient, whereby when the patient is clapped to break loose the debris of the lungs without significant injury to the tissue being clapped.

4,530,350

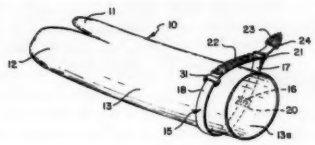
LIMB PROTECTIVE COVERINGS

Ronald E. Brown, 8437 Eaton Dr., Chagrin Falls, Ohio, and Jack M. Grinwis, 7354 La Costa Dr., Hudson, Ohio 44236

Continuation of Ser. No. 428,251, Sep. 28, 1981, abandoned. This application Mar. 22, 1984, Ser. No. 592,216

Int. Cl.[3] **A61F** *13/00*

U.S. Cl. 128—82 **7 Claims**



1. A limb protective covering comprising an elongate generally tubular, flexible, waterproof plastic member having at one end of one of an integral foot and hand receiving member and at the other end an opening receiving the limb to be covered, an elongate strap-like closure member adapted to encircle the limb of a user below said opening, said closure member having a heat sealed substantially single line portion transverse to the length of the closure member fixed to the wall of said tubular member adjacent the said opening as the sole engagement of the closure member to the tubular member, said closure member having first and second strap members extending from opposite sides of said heat sealed transverse line portion, said first member having a rigid loop on one end remote from the panel, the second strap member passing through said rigid loop, a stop member on the end of said second strap, mating

engagement fabric portions on said strap and on said stop member whereby said second strap may be drawn through said rigid loop of the first member, tightened into a water-tight seal on the limb and engaged upon itself with the mating engagement fabric of said second strap and stop member, a stabilizing loop heat sealed by a line portion at each end on said plastic tubular member and overlying said closure member at said transverse heat sealed line portion of the tubular member whereby to support said closure member and stabilize the same against removal.

4,530,351

DEVICE FOR PROTECTING THE WEB OF A HAND IN A MEDICAL CAST

Eliot Gordon, 2860 S. Ocean Blvd., Palm Beach, Fla. 33480

Continuation-in-part of Ser. No. 438,530, Nov. 1, 1982, which is a continuation-in-part of Ser. No. 403,352, Jul. 30, 1982, abandoned. This application Apr. 30, 1984, Ser. No. 605,140

Int. Cl.³ A61F *13/00, 5/04*

U.S. Cl. 128—82 **2 Claims**

1. A method of protecting the web portion of a hand comprising the steps of prewrapping a bandage material about the hand, affixing to the hand a U-shaped member having one leg lying across the palm and extending upwards towards said web portion of the hand forming the arcuate section of said U-shaped member about the web portion and wherein a second leg extends downward from said arcuate portion across the backside of the hand, applying casting material to said hand such that the U-shaped member protects the skin of the web portion of said hand from the casting material thereby preventing irritation and inflammation.

4,530,352

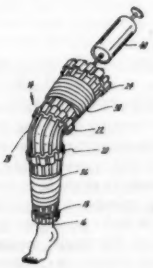
METHOD FOR APPLYING A SPLINT

Kenneth A. Holloway, 30904 Barton, Garden City, Mich. 48153

Filed Nov. 1, 1983, Ser. No. 547,564

Int. Cl.³ A61F *5/04*

U.S. Cl. 128—89 R **6 Claims**



1. A method for applying a splint to brace an injured body part comprising:

mounting a pair of spaced collars along the injured body part, each collar having a plurality of openings for receiving a plurality of tubular splint members, each collar comprising an elongated strap, and tongue and groove means for connecting the ends of the strap together;

supporting a plurality of resiliant, tubular splint members adjacent and about the injured body part such that each tubular splint member is received in aligned openings in the spaced collars, one of the tubular splint members being received by the tongue and groove means to join the strap ends of the two collars together;

filling the tubular splint members with a liquid material capable of hardening to a solid state; and

permitting the liquid material to harden such that the tubular splint members become rigid to brace the injured body part.

4,530,353

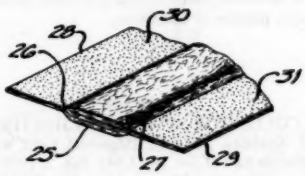
UNITARY ADHESIVE BANDAGE

Nels J. Lauritzen, Piscataway, N.J., assignor to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Filed Nov. 12, 1982, Ser. No. 440,900

Int. Cl.³ A61L *15/00*

U.S. Cl. 128—156 **6 Claims**



1. An adhesive strip bandage constructed of a single piece of bulky, heat-fusible nonwoven fibrous material, said bandage having a central pad portion and adhesive-coated end portions extending outward therefrom, said pad portion comprising a triple thickness of said fibrous material formed by a Z-fold over the area of said pad portion, said adhesive coated end portions comprising a single thickness of said fibrous material heat fused into a thin sheet-like structure, said folded pad portion being secured to said adhesive-coated end portions by heat fusing along at least the folded edges thereof whereby said pad portion is secured in said folded configuration.

4,530,354

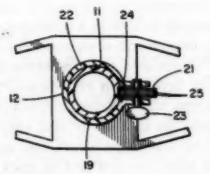
ENDOTRACHAEL TUBE AND HOLDER

Faustino C. Froilan, 101 Crabapple La., Morris, Ill. 60450

Filed Feb. 7, 1983, Ser. No. 464,260

Int. Cl.³ A61M *25/02*

U.S. Cl. 128—207.17 **4 Claims**



1. An endotracheal tube and holder comprising an elongated tubular member having a first outer end and a second insertable end to insert into the trachea of a patient, a holding member to hold said elongated tubular member in place when so inserted, said holding member including first elongated retaining means to frictionally engage an elongated peripheral wall portion of

said elongated tubular member to hold it against any substantial lateral movement relative to said holding member, and second retaining means to hold said tubular member against any substantial longitudinal movement relative to said holding member, wherein said first elongated retaining means of said holding member comprises a tubular sleeve portion, said elongated tubular member being slidably received in said tubular sleeve portion, wherein said elongated tubular member includes an elongated gear rack positioned on its outer wall, longitudinally thereof, extending from a point inwardly of said first outer end toward said first outer end, and wherein said second retaining means includes a pinion gear rotatably mounted along the outer wall of said tubular sleeve portion of said holding member, an opening in said outer wall to permit gear teeth of said pinion gear to extend through said opening into the tubular passageway of said tubular sleeve portion to engage the gear teeth of said gear rack when said elongated tubular member is inserted through said passageway with its said gear rack positioned to face and engage said gear teeth of said pinion gear, said pinion gear thereby holding said tubular member against any substantial longitudinal movement relative to said holding member until rotated.

4,530,355

COMPRESSION SCREW ASSEMBLY

Calvin Griggs, Memphis, Tenn., assignor to Richards Manufacturing Co., Inc., Memphis, Tenn.

Filed Jan. 18, 1982, Ser. No. 340,093
Int. Cl.³ A61F 5/04
U.S. Cl. 128—92 BB **4 Claims**

1. A compression screw assembly for applying compression to a fractured bone comprising:

a lag screw having a first engaging means formed thereon;

a compression plate including a hollow barrel member adapted to receive said lag screw in at least one fixed orientation, the interior of said barrel member having a second engaging means formed thereon;

a wrench assembly adapted to releasably engage said lag screw in axial alignment therewith;

optional clip means for being optionally insertable into said barrel member for the selective prevention or allowance of axial rotation of said lag screw with respect to said barrel member, said optional clip means having surface contours complimentary with said first and second engaging means for cooperating with said first and second engaging means to prevent said axial rotation when said optional clip means is inserted into said barrel member, and said lag screw being allowed to rotate with respect to said barrel member when said optional clip means is not inserted into said barrel member.

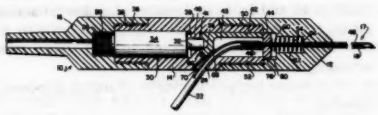
4,530,356

OPHTHALMIC SURGICAL INSTRUMENT WITH BEVELED TIP

Maxwell A. Helfgott, 5640 Bradley Blvd., Bethesda, Md. 20814, and Gerald N. Helfgott, 5513 Uppingham St., Chevy Chase, Md. 20815

Filed Feb. 8, 1983, Ser. No. 464,896
Int. Cl.³ A61B 17/32
U.S. Cl. 128—305 **19 Claims**

14. In an ophthalmic surgical apparatus comprising a handpiece portion and a projecting instrument portion, said instrument portion comprising rigid coaxial inner and outer tubular members with the inner tubular member axially slidable within the outer tubular member, and said handpiece portion comprising power-operated means for axially reciprocating said inner tubular member within said outer tubular member to produce a desired cutting function at the instrument tip, the improved instrument portion comprising an outer tubular member having a closed and beveled distal end, an inner tubular member having an open distal end which is similarly beveled and which is movable into the beveled end of the outer tubular member,



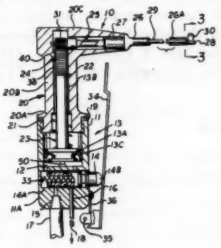
said outer tubular member being provided with a distal side wall opening which occupies at least part of the non-beveled area opposite the beveled portion of the outer tubular member, and said inner tubular member being in substantially continuous contact with the inside walls of the outer tubular member and having a counter-beveled cutting edge at its open distal end.

4,530,357

FLUID ACTUATED ORTHOPEDIC TOOL

James A. Pawloski, 189 Durfee St.; Graham Williams, 801 South St., both of Southbridge, Mass. 01550, and James A. Pawloski, Jr., 2 Summit St., Webster, Mass. 01570

Filed Apr. 18, 1983, Ser. No. 486,097
Int. Cl.³ A61B 17/32
U.S. Cl. 128—312 **3 Claims**



1. A fluid actuated orthorpedic tool comprising

a housing having a piston chamber formed therein, said chamber being open at one end,

a head means connected to said housing and defining an end closure at said one end,

a piston means slidably disposed within said piston chamber,

said piston means including a piston rod and a piston, said piston being connected to one end of said piston rod,

said piston rod having a pinion rack adjacent the other end of said piston rod,

a spring means acting on said piston for normally biasing said piston means toward an inoperative position,

said head means including a base, a connected elongated neck portion and a lateral extending mounting head portion,

said piston rod extending through the base and connected neck portion of said head means,

an elongated tubular guide connected to said lateral mounting head portion to define a lateral extension thereof,

cutter means including a fixed cutter member and a complimentary movable cutter member,

said fixed cutter member being connected to the projecting end of said tubular guide,

an elongated shaft rotatably journalled in said tubular guide, and said movable cutter member being connected to said

shaft for movement toward and away from said fixed cutter member as said shaft is rotated,

a pinion connected to said shaft wherein said pinion is disposed in meshing relationship with said rack to drive said shaft in one direction or the other as said piston is displaced within said piston chamber,

said housing having a fluid inlet and fluid outlet,

a valve means for controlling the flow of a fluid actuating medium to and from said piston chamber to actuate said piston and associated cutter means,

and a valve actuator connected to said valve means for actuating said valve means,

said valve means including a valve chamber disposed in said housing,

said valve chamber being in communication with said fluid inlet and fluid outlet and with said piston chamber,

a spool valve movably mounted in said valve chamber,

a spring means operating on said spool valve for normally biasing said spool valve toward its inoperative position and in engagement with said valve actuator,

and said spool valve including means for connecting said fluid inlet with said piston chamber and for sealing said piston chamber from said fluid outlet in the operative position of said spool valve and whereby said fluid inlet is sealed from said piston chamber and said piston chamber is connected to said fluid outlet in the inoperative position of said spool valve.

4,530,358

APPARATUS FOR COMMINUTING CONCRETIONS IN BODIES OF LIVING BEINGS

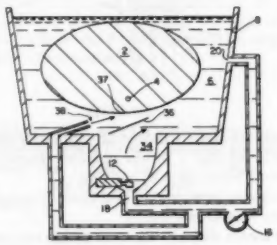
Bernd Forssmann, Friedrichshafen; Othmar Wess, Immenstaad; Hendrik Zech, Überlingen, and Christian Chaussy, Germering, all of Fed. Rep. of Germany, assignors to Dornier System GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Mar. 3, 1983, Ser. No. 471,673

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1982, 3210919

Int. Cl.³ A61B *17/22*

U.S. Cl. 128—328 **4 Claims**



1. In an apparatus for comminuting concretions in the body of a living being and including a focusing chamber forming part of an ellipsoid of revolution having two foci accordingly, further including spark discharge means situated in one of the foci, and the improvement of suppressing the dispersion effect of any gas bubbles comprising:

a tub for positioning the body so that the concrement becomes situated in a second one of the foci, the focusing chamber being directly mounted to the tub, the tub and the chamber being filled with liquid;

a common liquid circulation means for flushing liquid through the focusing chamber and the tub and having an inlet for liquid connected to the focusing chamber in the vicinity of the spark discharge means and having an outlet from the tub above the focusing chamber; and

inclined foil means in the tub under the space provided for the body and mounted above the focusing chamber, said liquid as circulated flowing along one or both of a coupling in location at the body and the lower side of said foil means towards said outlet.

4,530,359

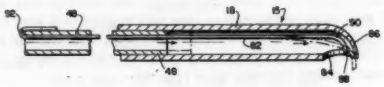
OPHTHALMIC PERFORATING INSTRUMENT AND SURGICAL METHOD EMPLOYING SAID INSTRUMENT

Maxwell A. Helfgott, 5640 Bradley Blvd., Bethesda, Md. 20814, and Gerald N. Helfgott, 5513 Uppingham St., Chevy Chase, Md. 20815

Filed Feb. 8, 1983, Ser. No. 464,892

Int. Cl.³ A61B *17/34*

U.S. Cl. 128—329 R **28 Claims**



1. An ophthalmic surgical instrument comprising a rigid elongated outer tubular member terminating in a distal end wall immediately adjoining a distal side opening; and a flexible elongated wire arranged within said outer tubular member and extending generally parallel to the longitudinal axis of said outer tubular member, said wire being axially movable within said outer tubular member and having its distal end positioned in proximity to the distal side opening in said outer tubular member, the distal end of said wire being formed with a single sharp distal tip adapted to form a discrete perforation in intraocular tissues; the distal end wall of the outer tubular member having a curved interior surface for deflecting the distal end of said wire so that the sharp distal tip of said wire projects through said distal side opening at an angle of about 90° relative to the longitudinal axis of the outer tubular member in response to axial movement of said wire toward the distal end of said outer tubular member.

4,530,360

METHOD FOR HEALING BONE FRACTURES WITH ULTRASOUND

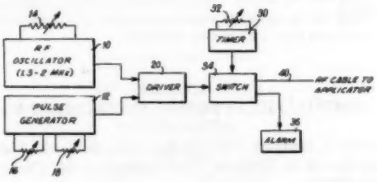
Luiz R. Duarte, Rua Campos Sales 2099, Sao Paulo, Brazil 13560

Filed Nov. 12, 1982, Ser. No. 441,237

Claims priority, application Brazil, Nov. 19, 1981, 8107560

Int. Cl.³ A61N *1/02*

U.S. Cl. 128—419 F **4 Claims**

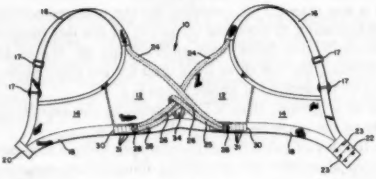


1. A method for healing bone fractures, pseudoarthroses and like defects in a human patient comprising the step of applying a pulsed radio frequency ultrasound signal to the skin of a patient directed to the defect site, said pulsed radio frequency signal having a frequency in the range of 1.3–2 MHz, and consisting of pulses generated at a rate in the range 100–1,000 Hz, with each pulse having a duration in the range 10–2,000 microseconds.

4,530,361
ADJUSTABLE BRASSIERE

Thomas P. Wooten, Brooklyn, N.Y., assignor to International Playtex, Inc., Stamford, Conn.

Filed Jul. 25, 1984, Ser. No. 634,340
Int. Cl.[3] A41C *3/00*
U.S. Cl. 128—483 13 Claims

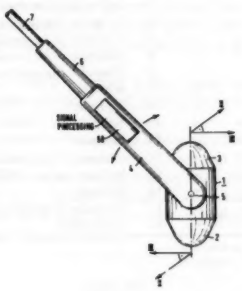


1. An adjustable brassiere including:
two independent breast retaining cups, each of said cups having at least one adjusting band including, fastening means at a remote end thereof;
a body encircling band attached to said breast retaining cups along their bottom edges and having adjustable back closure means adapted to permit a wearer to adjust the brassiere to accommodate different back widths; and
securing means provided at multiple positions around said body encircling band, said fastening means being adapted to engage said securing means at one of said multiple positions, wherein the volume of each of the breast retaining cups and the amount of garment coverage are determined by the position at which the fastening means at the end of its adjusting band engages the securing means.

4,530,362
ULTRASOUND DEVICE FOR SECTOR SCANNING

Walter Hetz, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 11, 1983, Ser. No. 512,251
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1982, 3226916
Int. Cl.[3] A61B *10/00*
U.S. Cl. 128—660 10 Claims

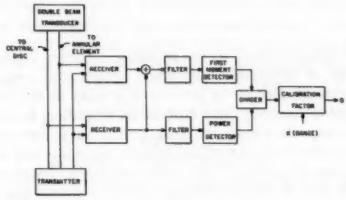


1. An ultrasound device for sector scanning an object, said device having an ultrasound transmitting/receiving system which comprises in combination:
(a) an applicator housing having an elongated shape with opposed ends thereof each being enclosed by a respective spherical calotte-shaped cap, said cap containing a coupling fluid for coupling ultrasonic waves;
(b) first and second ultrasound transducer heads, each transducer head operating on a different frequency from the other and having at least one transducer element, the heads being rotatably mounted within said opposed ends of said applicator housing and being mounted such that their respective transducer elements radiate ultrasound away from each other; and
(c) single drive means for moving said first and second ultrasound transducer head to produce a scanning type motion for each of them in a manner that the effects of undesirable mechanical inertial forces generated within either one of the rotating transducer heads are nullified by opposed inertial forces generated within the other one of the rotating ultrasound transducer heads.

4,530,363
TRANSDUCER ARRAY FOR SECTOR SCAN AND DOPPLER FLOW MEASUREMENT APPLICATIONS

Axel F. Brisken, Shingle Springs, Calif., assignor to General Electric Company, Rancho Cordova, Calif.

Filed Oct. 20, 1983, Ser. No. 543,945
Int. Cl.[3] A61B *10/00*
U.S. Cl. 128—663 1 Claim



1. In a method of measuring blood flow in a vessel by Doppler techniques, the steps of:
providing a two dimensional transducer array including a plurality of discrete transducer elements in a generally planar pattern, each transducer element being electrically and acoustically separated from other transducer elements, and each of said transducer elements being selectively actuated,
selectively actuating said transducer elements in a first modality as a linear transducer array for sector scanning and locating a vessel of interest,
selectively actuating said transducer elements in a second modality as a plurality of annular arrays for far field focusing on said vessel for blood flow measurements, and
selectively actuating said transducer elements in a third modality as a central disc and an outer annulus for near field focusing on said vessel for blood flow measurements.

4,530,364
COMPOSITION AND METHOD FOR EVALUATING SENSITIVITY TO METALS

Hal A. Huggins, 106 E. Cheyenne Rd., Colorado Springs, Colo. 80906

Filed Apr. 27, 1983, Ser. No. 489,061
Int. Cl.[3] A61B *5/00*
U.S. Cl. 128—670 6 Claims

1. The method of testing a person's sensitive reaction to metals such as mercury and nickel comprising the steps of:
measuring first values of selected vital signs of the person;
placing on an adhesive bandage a composition containing a small percentage of an inorganic salt of the metal for which the test is sought, a portion of propylene glycol, and a portion of water;
applying said bandage to the skin of the person so that the composition is in contact with the skin;
measuring second values of said selected vital signs after a first interval of time has elapsed after application of said bandage and composition; and
comparing the first and second values of said vital signs to calculate the change therebetween.

4,530,365

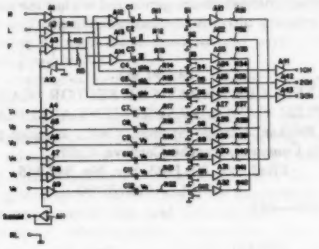
PHYSIOLOGICAL SIGNAL AMPLIFIER CIRCUITRY

Hajime Harada, Tokyo, and Takeshi Kojima, Saitama, both of Japan, assignors to Nihon Kohden Corporation, Tokyo, Japan

Filed Jul. 26, 1983, Ser. No. 517,512

Int. Cl.[3] A61B 5/04

U.S. Cl. 128—696 4 Claims



1. A physiological signal amplifier circuitry comprising a plurality of differential amplifiers which are connected to electrodes adapted to be located on a body to acquire action potential of the body, said differential amplifiers having a first kind of respective input terminals connected to said electrodes and a second kind of respective input terminals and including a plurality of selected differential amplifiers associated with selected ones of said electrodes, means for producing an averaged potential of output potential of said selected differential amplifiers, an amplifier for amplifying said averaged potential, said amplifier having sufficiently high gain as compared with each gain of said selected differential amplifiers and feeding its output to said second kind of input terminals of said differential amplifiers, said differential amplifiers producing potential output serving as physiological signals.

4,530,366

ELECTRONIC INSTRUMENT FOR THE CONTROL AND TREATMENT OF INFERTILITY IN WOMEN

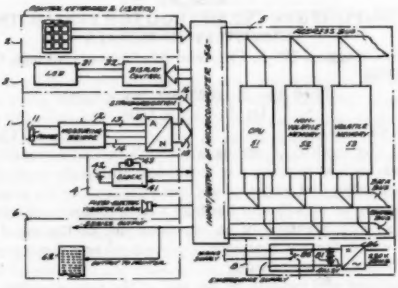
Pierre Nessi, Geneva, and Jacques Crausaz, Fribourg, both of Switzerland, assignors to Ares N.V. Amsterdam NL, Swiss Branch, Geneva, Switzerland

Filed Nov. 23, 1982, Ser. No. 443,889

Claims priority, application Switzerland, Dec. 1, 1981, 7692/81

Int. Cl.[3] A61B 5/00

U.S. Cl. 128—736 2 Claims



1. A method for characterizing a woman's menstrual cycle for aiding in the treatment of infertility comprising the steps of:

measuring and storing the woman's temperature on each of at least the first eight days of a menstrual cycle;

disregarding the temperatures taken on days 1 to 3;

calculating the mean value M_F of the temperatures taken on days 4 and 5;

calculating the mean value M_L of the temperatures taken on days 6, 7 and 8;

determining the difference $D=M_F-M_L$;

if D is greater than 0.3° C., defining the first of the three days forming the average M_L as the day of ovulation;

if D is less than 0.3° C., waiting for the next temperature and recalculating D from the mean M_L of the last three days of the cycle that have been entered and an M_F of all days preceding the last three days used for the calculation of M_L and so on until D is greater than 0.3° C.;

when D is greater than 0.3° C., defining the antepenultimate day of the cycle as the day of ovulation;

once the day of ovulation is determined, using a first predetermined algorithm for processing temperature measurements taken on days following the day defined as the day of ovulation, this algorithm being characterized as follows: the average of the follicular (post-menstrual) phase, taken as M_F does not change, however the average of the luteal phase (premenstrual phase) taken as M_L is calculated, using all of the days of the cycle from the day defined as the ovulation day thereby changing with each newly entered temperature, the ovulation day being confirmed as the day of ovulation if $D=M_L-M_F$ remains above or equal to 0.2° C. for at least three days; and if D again becomes less than 0.2° C. before the sixth day following the day defined as the day of ovulation, using said first algorithm or redefining the day of ovulation; and

in the event that the end of the cycle is reached without observing or defining a day of ovulation, utilizing a second algorithm to determine whether there exists a biphasic or monophasic cycle according to the following mathematical scheme: the cycle is arbitrarily divided into four equal parts I, II, III, and IV and the average temperature of each of these four parts is calculated: M_I, M_{II}, M_{III}, and M_{IV}; these four average temperatures then being compared with the overall average M of the complete cycle to yield one of sixteen possible mathematical combinations as set forth in the following table:

M_I	M_{II}	M_{III}	M_{IV}	No.	Comments
+	+	+	+	1	impossible
+	+	+	−	2	irregular or monophasic
+	+	−	+	3	biphasic to be confirmed (M_{IV})
+	+	−	−	4	irregular/monophasic
+	−	+	−	5	biphasic to be confirmed (M_{III})
+	−	−	+	6	biphasic to be confirmed (M_{IV})
+	−	−	−	7	irregular/monophasic
+	−	+	+	8	biphasic
−	+	+	+	9	biphasic
−	−	+	+	10	biphasic
−	+	+	−	11	biphasic
−	−	+	−	12	biphasic to be confirmed (M_{III})
−	+	−	+	13	biphasic to be confirmed (M_{IV})
−	−	−	+	14	biphasic
−	+	−	−	15	irregular/monophasic
−	−	−	−	16	impossible

+ = $M_{I, II, III}$ or $_{IV}$ above M

− = $M_{I, II, III}$ or $_{IV}$ below M;

in the event of an irregular or monophasic curve, providing an indication thereof; and

in the event of a biphasic curve, utilizing a third algorithm to determine the ovulation day, said third algorithm comprising the steps of:

determining the first daily temperature above a general average M of temperatures over the complete cycle; defining this as a temperature occurring on day P_1;

starting from day P_1, determining the next temperature below M, this temperature being designated as occurring on day P_2;

if the different $D=P_2-P_1$ is less than five days, considering

P_1 as not being the day of ovulation and repeating the process; and

if $D=P_2-P_1$ is more than five days or if P_2 coincides with the antepenultimate day, the penultimate day or the last day of the cycle, considering P_1 as the day of ovulation; and

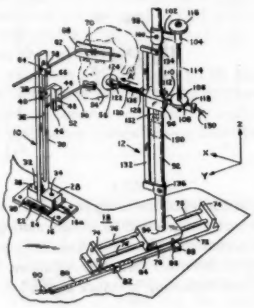
indicating the determined day of ovulation.

4,530,367

APPARATUS FOR MEASURING FACIAL SWELLING

Paul J. Desjardins, Maplewood, N.J.; Sathischandran Menon, Zion, Ill.; Maano Milles, Berkeley Heights, and Hans E. Pawel, Maplewood, both of N.J., assignors to N.J. Institute of Technology and University of Medicine and Dentistry, both of Newark, N.J.

Filed Sep. 15, 1983, Ser. No. 532,736
Int. Cl.³ A61B *5/10*
U.S. Cl. 128—777 **11 Claims**



1. Apparatus for measuring a volume change for facial swelling of a person, comprising:

bite fork means engageable within the mouth of said person for providing a relatively fixed reference position for said facial swelling;

reciprocable means having a free end and reciprocable in a first direction substantially normal to said facial swelling;

biasing means for maintaining said free end of said reciprocable means in communication with said facial swelling;

scanning means for moving said reciprocable means in a second direction substantially normal to said first direction to cause said free end to trace across said facial swelling in a plurality of parallel planes spaced apart by a predetermined distance;

first output means for producing a first signal in response to said reciprocable movement of said reciprocable means in said first direction;

second output means for producing a second signal in response to movement of said free end in said second direction; and

differential volume means for producing an output signal corresponding to said volume change in response to said first signal, said second signal and an input signal corresponding to said predetermined distance.

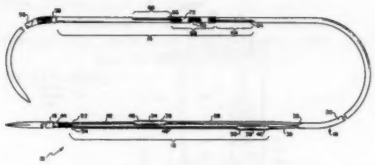
4,530,368

TEMPORARY BIPOLAR PACING LEAD

Stanley H. Saulson, Miami, and Walter H. Wesner, Plantation, both of Fla., assignors to Cordis Corporation, Miami, Fla.

Filed May 24, 1984, Ser. No. 613,586
Int. Cl.³ A61N *1/04*
U.S. Cl. 128—784 **11 Claims**

1. A bipolar temporary pacing lead comprising a lead body having a proximal end portion and a distal end portion, and including first and second spaced apart wire conductors each having a proximal end and a distal end and each being encased in an insulating material to form insulated wire conductors, a curved needle, at least one of said first and second wire conductors in said lead body distal end portion being connected to said curved needle, a straight neelde, a first elongate non-conductive member and a second elongate non-conductive member, the proximal end of each of said elongate non-conductive member being connected to said straight needle, first means for connecting said first elongate non-conductive member to a proximal end of said first wire conductor and second means for



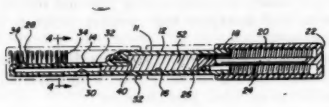
connecting said second elongate non-conductive member to a proximal end of said second wire conductor, and said distal end portion of said lead body having insulation removed from portions of said respective first and second insulated conductors thereby to form in said lead body distal end portion a first electrode-forming, bare wire conductor portion and a second electrode-forming, bare wire conductor portion.

4,530,369

FOUNTAIN TOOTHBRUSH

Ronald O. Adams, Lyons, Oreg., assignor to Santiam O. Adams, Lyons, Oreg.

Filed Jan. 11, 1983, Ser. No. 457,240
Int. Cl.³ A45D *44/18;* A46B *11/04;* B43K *5/06*
U.S. Cl. 132—84 B **3 Claims**



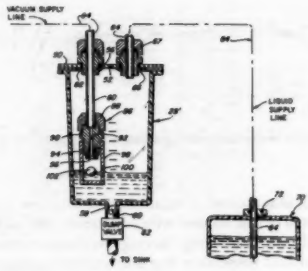
1. A fountain toothbrush including an elongated body having first and second ends and opposite front and rear longitudinal sides, one of said ends including brush bristles supported and projecting outwardly from said front side, the other end of said body including a smooth endwise outwardly opening longitudinal bore formed therein, a piston sealingly slidable in said bore, operator means connected to said piston, rotatable on said other end of said body and establishing a threaded connection between said piston and body for shifting said piston through said bore responsive to rotation of said operator means relative to said body, said body including an elongated supply passage therein, one end of said supply passage communicating with the inner end of said bore and the other end of said supply passage opening outwardly through said front side between adjacent bristles, said other end of said body being of greater cross-sectional area than the cross-sectional area of said one end of said body, said front side of said body including a delineation zone thereof between said one and other ends of said body angulated relative to the longitudinal center axis of said body and facing outwardly and toward said one end of said body, and a vent and refill passage aligned parallel to the longitudinal axis of said body, axially offset from said supply passage, one end of said vent and refill passage communicating with said inner end of said bore such that it is coterminous with said one end of said supply passage and the other end of said vent and refill passage opening through said front side in said delineation zone adapted to sealingly engage a collapsible tube of toothpaste and means removably closing said other end of said vent and refill passage.

4,530,370

DISPENSER FILLING APPARATUS AND METHOD

John W. Horky, Naperville, Ill., assignor to Babson Bros. Co., Oak Brook, Ill.

Filed May 25, 1983, Ser. No. 498,903
Int. Cl.³ B08B 3/00
U.S. Cl. 134—57 R **12 Claims**



9. An apparatus for measuring predetermined amounts of detergent, acid, and sanitizer from detergent, acid and sanitizer bulk containers respectively, and for dispensing said amounts during the cycle of a dairy pipeline cleaning system comprising:

a detergent metering chamber connected by a supply line to said detergent bulk container;

an acid metering chamber connected by a supply line to said acid bulk container;

a sanitizer metering chamber connected by a supply line to said sanitizer bulk container;

a first trap chamber connected by first and second vacuum lines to said detergent and sanitizer metering chambers respectively;

a second trap chamber connected by a third vacuum line to said acid metering chamber and by an intermediate vacuum line to said first trap chamber;

means for creating a vacuum in said second trap chamber during a first selected time in said cycle;

means for dumping said detergent from said detergent metering chamber into said cleaning system at a second selected time in said cycle;

means for dumping said acid from said acid metering chamber into said cleaning system at a third selected time in said cycle;

means for dumping said sanitizer from said sanitizer metering chamber into said cleaning system at a fourth selected time in said cycle;

means for blocking said first vacuum line in response to a selected amount of detergent in said detergent metering chamber;

means for blocking said second vacuum line in response to a selected amount of sanitizer in said sanitizer metering chamber; and

means for blocking said third vacuum line in response to a selected amount of acid in said acid metering chamber.

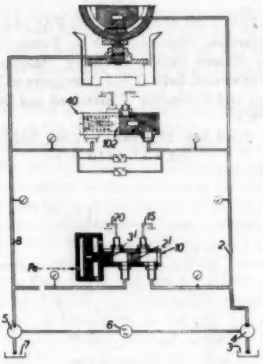
4,530,371

CONTROL OF FLUID PRESSURE CIRCUITS

Ronnie A. Arav, Bolton, England, assignor to Beloit Corporation, Beloit, Wis.

Filed Oct. 27, 1983, Ser. No. 546,099
Claims priority, application United Kingdom, Oct. 30, 1982, 8230928
Int. Cl.³ G05D 16/18
U.S. Cl. 137—115 **10 Claims**

1. A control system for controlling the pressure and pressure balance in two separate fluid pressure circuits comprising a valve, a balance piston disposed within a bore in the valve body, the balance piston being acted on by the fluid pressure existing in each of the first and second fluid pressure circuits, a relief line for one of the circuits whose communication therewith is controlled by the balance piston to enable the pressure in the first and second circuits to be balanced, a regulating piston received in a bore in the valve body and acted on by a



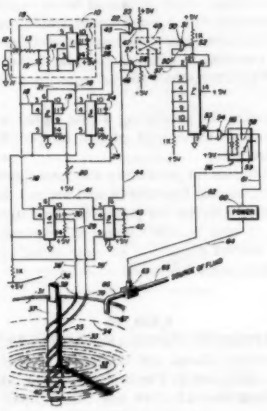
regulating pressure, a relief line being provided for the other of the circuits and being controlled by the regulating piston, and means being provided to control the regulating pressure such that the pressure in the other circuit is regulated to a pressure proportional to the regulating pressure applied to the regulating piston.

4,530,372

LIQUID LEVEL CONTROLLER

Raymond C. Overton, and Charles F. Cole, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Sep. 9, 1982, Ser. No. 416,207
Int. Cl.³ G01F 23/26
U.S. Cl. 137—392 **5 Claims**



1. Apparatus for controlling a liquid level between a maximum and a minimum in a container means comprising:

(a) clock means generating an output timing pulse;

(b) reference pulse means receiving said timing pulse and triggering the generation of first and second reference pulses, said first reference pulse having a width corre-

sponding to a function of the maximum level of said liquid and said second reference pulse having a width corresponding to a function of the minimum level of said liquid;

(c) capacitive probe means disposed in said container means in contact with liquid level between a maximum and a minimum to provide a proportional capacitive signal output;

(d) level sensing means triggered by said timing pulse to produce and output control pulse, and receiving said capacitive signal output to vary said control pulse width proportional to said liquid level;

(e) first and second gate means each receiving respective first and second output pulses as well as respective control pulse inputs and generating a first response signal when said first reference pulse and said control pulse occur at a time indicating that said fluid is at said maximum level, and a second response signal when said second reference pulse and said control pulse occur at a time indicating that said fluid level has dropped to said minimum level;

(f) means energizible to stop and to begin flow of fluid to said container means; and

(g) means responsive to first and second response signals to control said means energizible to stop the flow of liquid when said maximum level has been reached and begin the flow of fluid when said minimum level has been reached.

4,530,373

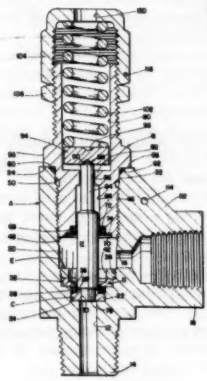
PRESSURE RELIEF VALVE

Carl R. Bork, Jr., Euclid; William C. Steiss, Parma; William P. Tobbe, Lyndhurst; Earl D. Shufflebarger, Mentor; Stephen Matousek, Chagrin Falls, and Thomas J. Gardner, Kirtland, all of Ohio, assignors to Nupro Company, Willoughby, Ohio

Filed Feb. 22, 1983, Ser. No. 468,780

Int. Cl.³ F16K *17/06*

U.S. Cl. 137—516.29 **16 Claims**



1. A pressure relief valve comprising:

a valve body having an inlet port and a lateral outlet port spaced from said inlet port, an enlarged bore between said ports, a poppet slidably guided between closed and open positions for respectively closing and opening said inlet port, biasing means for normally biasing said poppet to said closed position, a seal ring in said bore adjacent said inlet port in surrounding sealing relationship with said poppet in said closed position thereof, said seal ring being axially compressed between a retainer ring and a backup surface, an externally threaded ring nut threaded into said bore and compressively engaging said retainer ring, said ring nut being located in said bore entirely on the inlet port side of said outlet port, said valve body having stop means inwardly of said seal ring, and said stop means being engageable by said poppet in said closed position thereof.

4,530,374

LINEAR MOTOR-ACTUATED FLOW CONTROL VALVE

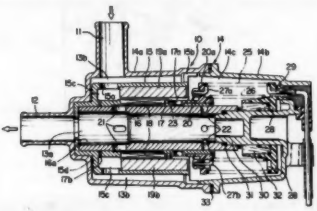
Motonobu Akagi, Kariya; Yasuhiro Kawabata, Anjo, and Kyo Hattori, Susono, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidoshakogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed May 3, 1982, Ser. No. 374,349

Claims priority, application Japan, May 2, 1981, 56-67346

Int. Cl.³ F16K *31/04, 11/07*

U.S. Cl. 137—625.3 **12 Claims**



1. A linear motor-actuated flow control valve comprising:

an outer casing having an inlet port and an outlet port;

a moving-coil linear motor disposed within said casing, said linear motor including a hollow, ferromagnetic core which delimits the interior of said casing into valve chambers and which has at least one first valve hole and at least one second valve hole axially spaced apart from each other for communicating said inlet port with said outlet port, a bobbin slidably disposed on said core for controlling the opening degree of the first and second valve holes, an electromagnetic coil wound on said bobbin, a permanent magnet so arranged that the magnetic flux produced thereby extends axially of said electromagnetic coil, and a ferromagnetic inner casing contacting a first end of said core and said permanent magnet for completing a magnetic circuit, in cooperation with said core, for the flux produced by said permanent magnet, said permanent magnet superposing over a region of said core, which region terminates at a maximum distance from said first end, said first valve hole being axially positioned on said core at a distance from said first end less than said maximum distance, said second valve hole being axially positioned on said core at a distance from said first end greater than said maximum distance;

spring means for biasing said bobbin so that said bobbin is retained at a predetermined position by said spring means when said electromagnetic coil is in the de-energized state, whereby said first and second valve holes are held open or closed to a predetermined degree; and

power supply lines to said coil.

4,530,375

ATTENUATING ROTATING VALVE

Roger Bey, 19, Rue des Rossignols, 68110 Illzach, France

Filed Dec. 11, 1979, Ser. No. 103,182

Claims priority, application Finland, Jan. 10, 1979, 790084

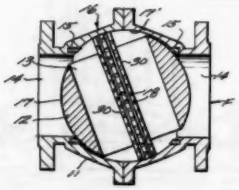
Int. Cl.³ F16K *5/10, 47/04*

U.S. Cl. 137—625.32 **7 Claims**

1. An attenuator valve assembly comprising: a valve body having a flow passage formed therethrough; a closure member having a regular curved exterior surface and having a single elongated bore formed therethrough; means for mounting said closure member in said valve body for rotation about an axis with respect to said valve body to and between an open position wherein said bore is substantially inline with said flow

passage, and a closed position wherein said bore is substantially perpendicular to said flow passage; said closure member bore having a predetermined height in the dimension of said closure member axis of rotation, and a predetermined length in the dimension of elongation thereof; sealing means provided in said valve body flow passage for operatively engaging said closure member curved exterior surface and for preventing fluid passage through said flow passage except through said closure member bore; and

means for attentuating fluid flowing through said closure member bore in either direction without significantly restricting flow when said closure member is in said open position,



said means comprising perforated barrier means mounted in said closure member bore, said barrier means spanning substantially entirely said bore predetermined height and having an operative perforated portion, with perforations extending substantially perpendicular to said bore, extending outwardly from either end of said bore to points substantially on a geometric extension of said curved exterior surface of said closure member;

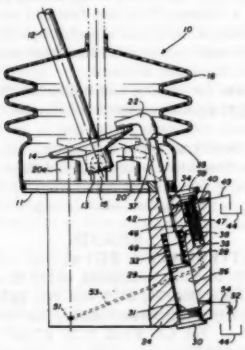
said barrier means comprising a plurality of flat plates, and wherein the ratio of perforation area to total plate is smallest in the plate that is most upstream, and largest in the plate that is most downstream.

4,530,376

PILOT VALVE INCLUDING A HYDRAULICALLY ACTUATED DETENT

Probir K. Chatterjea, Mt. Prospect, Ill., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 19, 1983, Ser. No. 533,464
Int. Cl.³ F15B *15/26, 13/01*
U.S. Cl. 137—636.1 **7 Claims**



1. A hydraulically actuated detent for a universally tiltable joy stick of a pilot valve having a circular series of valves arranged about a vertical axis through said pilot valve and selectively operated by movement of said joy stick into engagement therewith for latching said joy stick in a selected one position for actuating one of said valves comprising:

cam means attached to said joy stick and movable therewith;

plunger means spaced from said circular series of valves selectively movable into engagement with said cam means for latching said joy stick in said selected one position and maintaining each of the other of said valves in their deactuated positions independent of the movement of said selected one valve;

hydraulically operated actuating means for moving said plunger means into engagement with said cam means including fluid supplying means for developing a fluid force acting upon said plunger means, to move said plunger means into engagement with said cam means;

valve means responsive to actuation of said selected one valve for controlling the flow of said fluid through said supply means and means for removing the fluid force acting on the plunger means; and

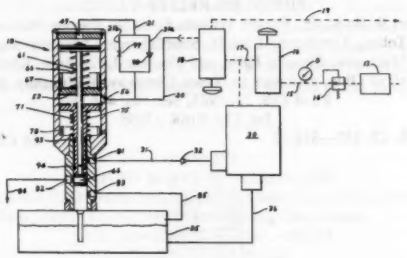
plunger return means for disengaging said plunger means from said cam means upon removal of said fluid force for delatching said joy stick.

4,530,377

BLOCK VALVE

Clifford M. Peters, Longview, Tex., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Aug. 8, 1983, Ser. No. 521,486
Int. Cl.³ F16K *31/122*
U.S. Cl. 137—637.2 **3 Claims**



1. A valve device adapted for controlling distribution of fluid between a hydraulic fluid supply, a fluid actuator device and a reservoir, said device comprising:

an elongate valve body having an axial bore extending therethrough including a reduced diameter bore section and an enlargement thereof which provides an enlarged diameter bore section;

transverse wall means dividing said enlarged diameter bore section into longitudinally spaced first and second piston chambers, said valve body being provided with an inlet port, an outlet port and a bleed port which communicate with the reduced diameter section of the axial bore at longitudinally spaced locations;

a first plunger element slidably mounted in said axial bore for movement between first and second operating positions, said first plunger element including an elongate rod having an enlarged diameter blocking portion slidably disposed within the reduced diameter bore section and a first piston affixed to said rod and disposed within said first piston chamber;

a second plunger element comprising an elongate rod having a reduced external diameter portion cooperating with the wall of said axial bore to define an annular chamber therewith, a second piston affixed to the rod of the second plunger element and an elongate bore extending axially through the rod and piston portions of said second plunger element, said second plunger element being disposed intermediate the first piston and the blocking portion of the rod of the first plunger element in sleeved relationship to the rod portion of the first plunger element, said second

plunger element being adapted for sliding movement on the rod portion of the first plunger element between first and second operating positions;

first spring means for urging the first plunger element and said first piston towards its first operating position;

second spring means for urging the second plunger element and said second piston in a direction outwardly of said reduced diameter bore section towards its first operating position, said first and second piston chambers being each provided with fluid inlet port means whereby a pressurized pilot fluid delivered to said piston chambers through said fluid inlet port means will simultaneously urge the first and second plunger elements to their respective second operating positions, each said plunger element being moved by its associated spring means to the first operating position when pressurized pilot fluid is removed from the piston chambers, said enlarged diameter blocking portion of the first plunger element being positioned intermediate the inlet and bleed ports of the valve body and adjacent said outlet port when the first plunger element is in its first operating position to block fluid communication between the respective inlet, outlet and bleed ports of the valve body;

first seal means mounted about the periphery of the rod of the second plunger element at a location intermediate the second piston and said annular chamber for blocking fluid communication between said inlet port and the second piston chamber for all operating positions of the second plunger element; and

second seal means mounted about the periphery of the rod portion of the second plunger element and located intermediate the blocking portion of the first plunger element and said annular chamber, said second seal means being disposed intermediate the inlet and outlet ports when the second plunger element is in its first operating position for blocking fluid communication between the inlet port and the outlet port of the valve, said second seal means being disposed intermediate the outlet port and the bleed port when said second plunger element is in the second operating position for blocking communication therebetween and said annular chamber being disposed adjacent both said inlet and outlet ports in the second operating position of the second plunger element for establishing communication between the inlet and outlet ports when the second plunger element is in its second operating position, said blocking portion and seal means being simultaneously carried with said plunger elements on moving to said second operating position.

4,530,378

COMPOSITE TUBULAR BODY

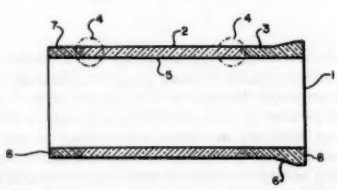
Manfred Boog, Rodenbach, and Werner Jakob, Gründau, both of Fed. Rep. of Germany, assignors to Heraeus Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany

Filed Jul. 30, 1982, Ser. No. 403,398

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1981, 3141919

Int. Cl.³ F16L 9/22

U.S. Cl. 138—109 **15 Claims**



1. A composite tubular body with at least one open end, comprising at least one annular zone of fused quartz and at least of one annular zone of quartz glass, said fused quartz produced essentially from quartz sand and said quartz glass from rock crystal or synthetic silicon dioxide, at least one of said annular zones of fused quartz fused at its end to one end of said annular zone of quartz glass to define a transition zone therebetween having a length of at least 10 mm and a diameter of at least 150 mm.

4,530,379

FILAMENT WOUND INTERLAMINATE TUBULAR ATTACHMENT

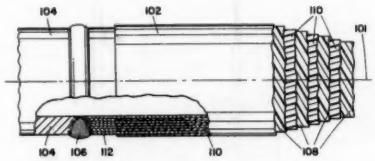
Frederick J. Policelli, Cumberland, Md., assignor to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 372,426, Apr. 27, 1982, abandoned.

This application Sep. 19, 1984, Ser. No. 652,162

Int. Cl.³ F16L 9/22

U.S. Cl. 138—109 **6 Claims**



1. A joinable tube having a central axis and a filament wound portion, said joinable tube comprising:

a filament wound body that is the filament wound portion of said joinable tube, said filament wound body being composed of a tubular, filament wound, middle section integral between tubular, filament wound, first and second end sections of said tube, said first and second end sections adapted to be respectively connectable to first and second tubular members and transmit loads through such connections into said middle section;

said filament wound body being formed of (i) cylindrical first layers of high strength, filament wound fibers (a) disposed at about 80°–90° degrees in absolute value relative lines parallel said central axis and (b) extending around said central axis at said middle section and (ii) cylindrical second layers of high strength, filament wound fibers, said second layers alternating in radial direction with said first layers and (a) disposed at about 5°–75° degrees relative lines parallel said central axis and (b) extending around said central axis at said middle section and at said first and second end sections;

absences of said first layers in said first end section forming a plurality of cylindrical first end spaces respectively between said second layers in said first end section that are radially adjacent each other across the locations where said first layers are absent;

a plurality of cylindrically concentric, load bearing first shells embedded in said first end section, said first shells fitting respectively in said first end spaces;

each of said first shells having cylindrical inner and outer first shell surfaces, said first shell surfaces covered with adhesive so as to bond said first shells in said first end section to respectively adjacent cylindrical surfaces of said second layers that form said respective first end spaces in said first end section;

absences of said first layers in said second end section forming a plurality of cylindrical second end spaces respectively between said second layers in said second end section that are radially adjacent each other across the locations where said first layers are absent;

a plurality of cylindrically concentric, load bearing second shells embedded in said second end section, said second shells fitting respectively in said second end spaces;

each of said second shells having cylindrical inner and outer

second shell surfaces, said second shell surfaces covered with adhesive so as to adhesively bond said second shells in said second end section to respectively adjacent cylindrical surfaces of said second layers that form said respective second end spaces in said second end section.

4,530,380

SINGLE-LEG HOOK FOR A DOUBLE LIFT OPEN SHED JACQUARD LOOM

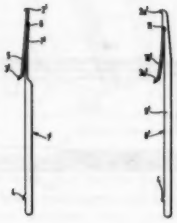
Wolfgang Seiler, Monchen-Gladbach, Fed. Rep. of Germany, assignor to FA. Oskar Schleicher, Fed. Rep. of Germany

Filed Sep. 28, 1983, Ser. No. 537,247

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1983, 3313617

Int. Cl.³ D03C *3/00*

U.S. Cl. 139—59 **9 Claims**



8. A single-leg hook for a double lift open shed Jacquard loom comprising an elongate leg having first and second ends, at least a substantial portion of the length of the leg, starting from said first end towards said second end, being relatively rigid, a support projection disposed on said rigid portion of said leg adjacent said first end thereof, and first and second suspension projections which are disposed on a portion of said leg adjacent said second end thereof and which face at least substantially in the same direction, said portion of said leg which carries said first and second suspension projections being resiliently deflectable relative to said rigid portion of said leg.

4,530,381

WEFT RESERVOIR CONTROLLER USED FOR FREELY CHANGEABLE ALTERNATE WEAVING ON A FLUID-JET LOOM

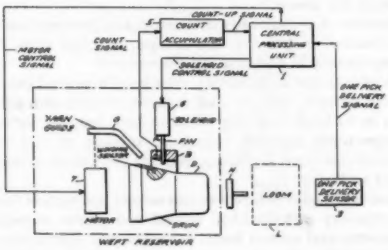
Yujiro Takegawa, Shizuoka, Japan, assignor to Tsudakoma Kogyo Kabushiki Kaisha, Japan

Filed Dec. 14, 1983, Ser. No. 561,325

Claims priority, application Japan, Dec. 27, 1982, 57-234712

Int. Cl.³ D03D *47/36*

U.S. Cl. 139—452 **4 Claims**



1. Apparatus for reserving weft on a weft reservoir associated with a loom, said apparatus comprising:

a weft reservoir including a reservoir drum, a yarn guide, a motor for causing relative movement between said yarn guide and said reservoir drum as a function of motor control signals applied thereto, and control pins driven by solenoids between an operative position wherein they catch the weft wound on the reservoir drum by the relative rotation of said yarn guide and said reservoir drum and an inoperative position wherein they release said caught weft, said solenoids moving said control pins between said operative and inoperative positions as a function of solenoid control signals applied thereto;

a winding detector for generating a count signal each time a single revolution of weft is wound about said reservoir drum;

a count accumulator coupled to said winding detector for counting the number of count signals generated by said detector, said count accumulator generating a count-up signal each time it counts a predetermined number of count signals which correspond to the length of weft equal to a single pick of weft for said loom;

means for generating a one pick delivery signal each time a single pick of weft has been inserted into a shed on said loom; and

a control circuit for generating appropriate solenoid and motor control signals to initiate a weft reservation operation, wherein a single length of weft equal to a single pick of weft is reserved on said reservoir drum, causing said motor to initiate said relative rotation between said yarn guide and said reservoir drum each time said one pick delivery signal is generated and for terminating said weft reservation operation by causing said motor to stop said relative rotation between said yarn guide and said reservoir drum in response to the generation of said count-up signal.

4,530,382

SHED FORMING ARRANGEMENT

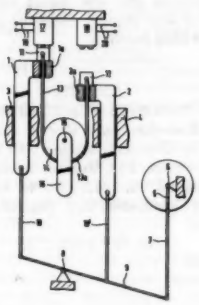
Oskar H. Schleicher, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Fa. Oskar Schleicher, Fed. Rep. of Germany

Filed Sep. 6, 1983, Ser. No. 529,549

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1982, 3233547

Int. Cl.³ D03C *13/00, 3/20*

U.S. Cl. 139—455 **5 Claims**

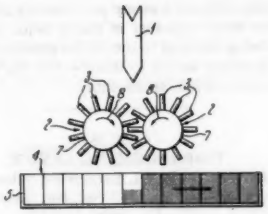


1. A shed forming arrangement for a textile machine, including first and second lift elements movable in opposition to each other, a respective holding member in the form of a magnet armature member on each said lift element; said holding members being relatively moveable with respect to said lift elements and connected together to form a respective pair by a connecting member forming a loop, a roller carried in the loop, means for connecting the roller to shedding means of the machine, and first and second holding magnets co-operable with respective ones of the holding members and actuable by program means to selectively retain said respective holding members away from said lift elements.

4,530,383
APPARATUS FOR FEEDING THE GROWING SUBSTRATE INTO THE CELLS IN A SET OF GROWING CELLS

Jouko Lehtinen, Iso-Vimma, and Kari Saarinen, Säkylä, both of Finland, assignors to Lännen Tehtaat Oy, Iso-Vimma, Finland

Filed Dec. 30, 1982, Ser. No. 454,858
Claims priority, application Finland, Dec. 31, 1981, 814225
Int. Cl.³ B65B 1/10
U.S. Cl. 141—71 1 Claim

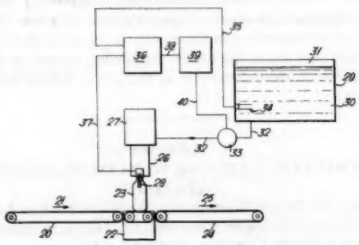


1. An apparatus for feeding a growing substrate into cells of a set of growing cells comprising two horizontal cylindrical rolls positioned side by side and having parallel axes, a gap between the rolls, a plurality of resilient pins projecting radially outwardly from each outer surface of the rolls in planes normal to the axes of said rolls, the pins on one of the rolls being offset from the pins of the other roll in the direction of the roll axes, the length of the pins being slightly less than the gap between the rolls, each of the rolls rotatably driven in opposite directions at a circumferential velocity of from 3 m/s to 10 m/s so that the outer surfaces of the rolls adjacent the gap have downwardly oriented directions of rotation, the speed of the rolls determined by the specific weight of the growing substrate fed thereinbetween, so that the growing substrate is delivered into the cells with sufficient kinetic energy imparted by the rolls in a manner to compact material of the growing substrate previously introduced into the cells.

4,530,384
DEVICE FOR USE IN A BOTTLE FILLING HEAD

Adrian P. Boyes, Edgbaston, England, assignor to Vickers plc, Birmingham, England

Filed Oct. 19, 1983, Ser. No. 543,587
Claims priority, application United Kingdom, Oct. 19, 1982, 8229889
Int. Cl.³ B67C 5/37; B65B 3/04
U.S. Cl. 141—95 11 Claims

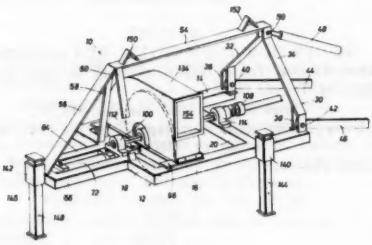


8. A bottle filling apparatus which comprises (1) a conveyor system for conveying empty bottles to a bottle filling station; (2) a bottle filling head, including a device as claimed in any one of claims 1–4, located at the bottle filling station; (3) means for bringing bottles sequentially into contact with the bottle filling head; (4) means for supplying a liquid via the bottle filling head to the exterior surface of the vent tube of said device; (5) circuit means connected to the elongate electrical conductors of said device and arranged to allow said conductors to function as a level detector, the circuit means being arranged to produce an output command when the response of said conductors corresponds to a predetermined liquid level within a bottle which is being filled; (6) process control means, responsive to commands from said circuit means, for controlling operation of the bottle filling head and supply of liquid thereto; and (7) means for conveying filled bottles away from said filling station.

4,530,385
APPARATUS FOR REMOVING TREE STUMPS

Norman N. York, 3705 Broadway, Houston, Tex. 77017

Filed Feb. 21, 1984, Ser. No. 581,917
Int. Cl.³ B02C 1/04; A01G 23/08
U.S. Cl. 144—2 N 16 Claims



1. Tractor supported and operated stump removal apparatus, comprising:

(a) a frame structure adapted to be supported, raised and lowered by the hitch structure of the tractor;

(b) slide means being positioned for guided reciprocal movement on said frame structure;

(c) means for imparting linear reciprocal movement to said slide means;

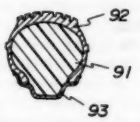
(d) a non-circular drive shaft being mounted for rotary moement on said frame structure and adapted to be driven by the power take-off of the tractor; and

(e) a rotary cutter element being rotatably mounted on said slide means and movable along with said slide means, said rotary cutter element having means providing sliding, non-rotatable relation with said drive shaft, whereby said cutter element is rotated by said drive shaft and is capable of simultaneous linear movement by said linear reciprocal movement imparting means.

4,530,386
CUSHION TIRE

Akitaro Nakahira, Takarazuka, Japan, assignor to Hohyu Rubber Co., Ltd., Ikeda, Japan

Division of Ser. No. 323,047, Nov. 19, 1981, Pat. No. 4,429,068.
This application Oct. 25, 1983, Ser. No. 545,336
Claims priority, application Japan, Nov. 20, 1980, 55-164192; May 20, 1981, 56-77077
Int. Cl.³ B60C 7/00
U.S. Cl. 152—315 16 Claims



1. A non-puncture tire comprising a tire member and a ring member fitted into the tire member, the ring member being

composed of a cured rubber material comprising (A) 100 parts by weight of a rubber component, (B) 100 to 2000 parts by weight of a factice, and (C) 200 to 2000 parts by weight of a softening agent, the cured rubber material having a hardness of from a maximum of 30° as measured with an A-type rubber hardness tester to a minimum of 15° as measured with an F-type rubber hardness tester, an impact resilience of not less than 50% and a tensile strength of 0.1 to 100 kg/cm^2.

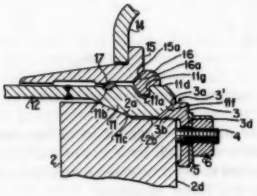
9. A solid tire comprising a ring core and a cover member covering the ring core, the ring core being composed of a cured rubber material comprising (A) 100 parts by weight of a rubber component, (B) 100 to 2000 parts by weight of a factice, and (C) 200 to 2000 parts by weight of a softening agent, the cured rubber material having a hardness of from a maximum of 30° as measured with an A-type rubber hardness tester to a minimum of 15° as measured with an F-type rubber hardness tester, an impact resilience of not less than 50% and a tensile strength of 0.1 to 100 kg/cm^2.

4,530,387

SPIDER HUB AND A WHEEL RIM ASSEMBLY

Shigeru Osawa, Tokyo, Japan, assignor to Topy Industries, Limited, Tokyo, Japan

Filed Sep. 14, 1982, Ser. No. 418,072
Claims priority, application Japan, Nov. 10, 1981, 56-179998
Int. Cl.^{3} B60C *15/02*
U.S. Cl. 152—410 **5 Claims**



1. A wheel rim and spider hub assembly of the flange-removable type for multiple-piece wheel rims, said assembly comprising:

a. a spider hub having an axial line, a front face, an outer circumference including an outer cylindrical surface extending parallel to the axial line and an inner conical surface having an inclined angle, and a plurality of clamp bolts extending outwardly from the front face;

b. a wheel rim positioned co-axially around the spider hub and having a cylindrical rim base comprised of:

(1) a cylindrical, cantilevered gutter band extending parallel to the axial line and having an inner conical surface defined along the surface of the gutter band next to the spider hub and matingly engaging the inner conical surface of the spider hub to thereby support the gutter band, an outer conical surface defined along a surface of the gutter band next to the spider hub and near the front face thereof and including an inclined angle, and a gutter circumferentially defined along the surface thereof remote from the spider hub;

(2) an annular split locking ring having an upper conical surface including an inclined angle and being adapted to engage the gutter of the gutter band;

(3) an annular bead seat band having a conical outer edge which matingly engages the upper conical surface of the split locking ring, the band extending parallel to the axial line and being overlappingly positioned parallel to and outwardly from the gutter band on the side thereof remote from the spider hub; and

(4) an annular side flange outwardly and abuttingly positioned next to the bead seat band,

wherein the split locking ring holds an annular body formed by the abutted side flange and the bead seat band and engages the annular body along the conical outer edge of the bead seat band;

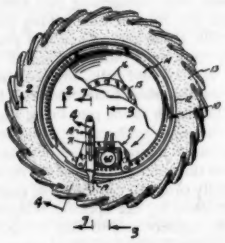
c. a plurality of L-shaped clamp pieces, each clamp piece having a wedge member inserted between the outer conical surface of the gutter band of the wheel rim and an outer cylindrical surface of the outer circumference of the spider hub to provide support for the cantilevered gutter band, each wedge member including a conical surface which matingly engages the outer conical surface of the gutter band and an inner cylindrical surface which abuts the outer cylindrical surface of the outer circumference of the spider hub, each clamp piece having a hole for receiving one of the plurality of clamp bolts, and each clamp piece being clamped to one of the plurality of clamp bolts by a clamping means to thereby join the spider hub and the wheel rim into an assembly.

4,530,388

TIRE HANDLING DEVICE

Harold L. Krueger, R. R. #1, Barnesville, Minn. 56514

Filed Jun. 30, 1983, Ser. No. 509,353
Int. Cl.^{3} B60C *25/08*
U.S. Cl. 157—1.22 **11 Claims**



1. In a tire handling device for mounting or removing a tire on a wheel rim while the wheel is attached to the vehicle, the device comprising:

a circular track insertable into a rim from the exterior thereof and provided with means accessible from the exterior of the rim for detachably securing the track to the rim and holding the same against circumferential movement with respect to the rim;

a motor having a rotatable element driven by the motor;

means for supporting the motor on the track with the rotatable element drivably coupled to the track so that upon operation of the motor, the motor travels around the rim;

roller means secured to said motor supporting means and engaging said track at spaced points to guide the motor supporting means as the motor travels around the rim; and

means secured to the motor supporting means for driving a tire tool around the rim as the motor moves around the rim.

4,530,389

RETRACTABLE AWNING WITH IMPROVED SET-UP CAPABILITY

Anthony W. Quinn, Westminster; Donald S. McKee, Louisville, and Richard B. Rader, Thornton, all of Colo., assignors to The Scott & Fetzer Company, Westlake, Ohio

Filed Aug. 18, 1983, Ser. No. 524,455
Int. Cl.^{3} E04F *10/06*
U.S. Cl. 160—46 **36 Claims**

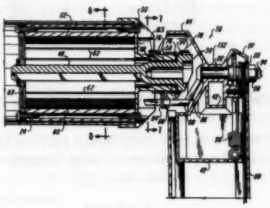
1. In a retractable awning assembly having a roll bar upon which a canopy is rolled, a wind-up power spring for rotationally biasing the roll bar for rolling the canopy thereon, a support arm having one end operatively connected to one end of the roll bar and another end for contacting a support surface,

and a roll control mechanism in combination therewith including improvements comprising:

a sleeve member operatively connected to rotate with the roll bar;

a first spring clutch having an end operatively restrained by said support arm and having a plurality of coils wound around the sleeve member in a direction for constricting around said sleeve member to restrain rotation of the roll bar in a first rotational direction and for allowing rotation in a second rotational direction opposite to the first direction;

a second spring clutch having an end operatively restrained by said support arm and having a plurality of coils wound around the sleeve member in a direction for constricting around said sleeve member to restrain rotation of said roll bar in the second rotational direction and for allowing rotation in the first rotational direction; and



selector means operatively connected to said first and second spring clutches for selectively controlling the constriction of each of said first and second spring clutches around the sleeve member to control the direction of rotation of the roll bar, said selector means operatively allowing constriction of said first spring clutch and simultaneously inhibiting constriction of said second spring clutch to allow the roll bar to rotate in the second rotational direction and restrain rotation of the roll bar in the first rotational direction and selectively alternatively allowing constriction of said second spring clutch and simultaneously inhibiting constriction of said first spring clutch to allow the roll bar to rotate in the first rotational direction and restrain rotation of the roll bar in the second rotational direction.

4,530,390

VENETIAN BLIND SUSPENSION MEMBER SUPPORT LINK CONSTRUCTION

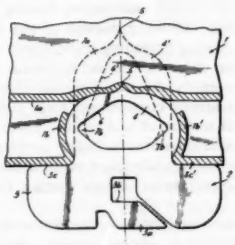
René Schluep, Tobel, and Hugo Eisenring, Balterswil, both of Switzerland, assignors to Griesser AG, Switzerland

Filed Jul. 18, 1983, Ser. No. 514,659

Claims priority, application Switzerland, Aug. 27, 1982, 5266/82

Int. Cl.³ E06B 9/38

U.S. Cl. 160—178 R **7 Claims**



1. A support link for a venetian blind wherein the slats of the blind are supported on supporting elements which are connected to the slats by a support link and wherein the slats have hollow flanged ends with a hollow cavity therein, comprising a flat metallic piece having a head portion and a clamping ring portion integrally formed with said head portion which extends outwardly from a side of said head portion and is of a length greater than the diameter of the hollow flange and which comprises two substantially parallel side edges and at least one cutting edge at its outer end, said cutting edge being drivable through the outer wall of the flange portion and through the hollow interior to opposite interior wall of the flange portion, said clamping ring portion having an aperture between the side edges located to facilitate buckling of the clamping ring portion against the walls of the flange which are penetrated by the cutting edge to form a clamping engagement therewith, said flange portion including an outer wall with wall strips which are cut out of said outer wall and are bendable into the hollow portion thereof by engagement of said clamping ring into said flange portion.

4,530,391

APPARATUS FOR THE PRODUCTION OF DIE-CAST PARTS WITH ADJUSTABLE PISTON TRAVEL LENGTH AND INITIAL AND FINAL POSITIONS

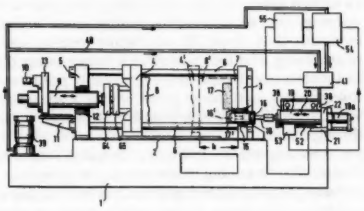
Roland Fink; Hubert Bartos, both of Winterbach; Herbert Noschilla, Schorndorf, and Walter Klingenstein, Urbach, all of Fed. Rep. of Germany, assignors to Oskar Frech GmbH & Co., Schorndorf-Weiler, Fed. Rep. of Germany

Filed Oct. 13, 1983, Ser. No. 541,700

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1982, 3238202

Int. Cl.³ B22D 17/32, 17/18

U.S. Cl. 164—155 **18 Claims**



1. Apparatus for the production of die-cast parts comprising:

a die including movable and stationary die half sections mounted on movable and stationary die platens, respectively, said die half sections defining a die cavity,

a casting unit comprising a casting chamber mounted on said stationary die platen and a casting piston movable in said casting chamber for filling said die cavity with melt, said casting piston having a relatively large cross-section and being arranged for travel into said movable die half section during a die cavity filling step after said die half sections have been mated,

a drive piston connected to said casting piston for moving the latter,

a casting cylinder receiving said drive piston and being mounted on a guide for movement in the direction of the axis of said drive piston, said casting cylinder carrying first and second terminal stops defining the final and initial locations of the stroke of said drive piston,

means for independently adjusting said first and second stops relative to said die and said drive piston and relative to each other whereby the final and initial positions of said casting piston can be independently adjusted, and the length of the stroke of said casting piston can be adjusted,

means for supplying pressure to said drive piston within said casting cylinder,

means supporting said casting cylinder for adjustment relative to said drive piston in the direction of said drive piston, and

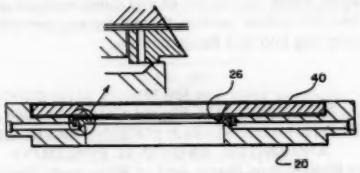
signal generating transducer means for sensing the position of said casting piston relative to said die for determining the position of said casting piston within said movable die half section.

4,530,392

CONTINUOUS CASTING MOLD

Robert D. Read, Beaumont, Tex., assignor to North Star Steel Texas, Inc., Beaumont, Tex.

Filed May 20, 1983, Ser. No. 496,750
Int. Cl.³ B22D *11/12*
U.S. Cl. 164—268 **6 Claims**



1. In a tubular continuous casting mold having a top flange at the top thereof, the top flange being provided with a generally central opening for the pouring of molten metal therethrough into the continuous casting mold, the improvement comprising:

(a) an upper recess in the top of said top flange surrounding said generally central opening, and adapted to receive a retaining plate therein;

(b) a second lower recess surrounding said generally central opening, said second recess having lesser horizontal dimensions than those of said upper recess, said second recess being adapted to receive a flange insert therein;

(c) a stainless steel flange insert removably positioned in said lower recess, said flange insert having a generally central vertical opening for the pouring of molten metal therethrough; and

(d) a retaining plate removably fastened into said upper recess, said retaining plate having a generally central vertical opening aligned with each other pouring opening, and having its upper surface substantially co-planar with the top of said top flange.

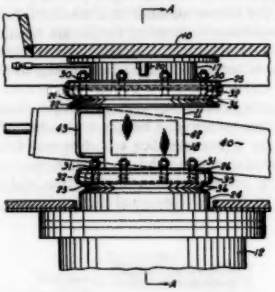
4,530,393

APPARATUS FOR SHROUDING IN A CONTINUOUS CASTING MACHINE

Joseph Rokop, Pittsburgh, and Nikolaus Rokop, Bridgeville, both of Pa., assignors to Rokop Corporation, Pittsburgh, Pa.

Filed Jul. 22, 1983, Ser. No. 516,044
Int. Cl.³ B22D *11/00, 11/10*
U.S. Cl. 164—415 **12 Claims**

1. In a shrouding apparatus including a substantially-rigid shrouding sleeve for removable insertion between a tundish and an underlying mold to vertically enshroud a liquid stream issuing from the tundish into an underlying mold, the improvement comprising, said shrouding sleeve consisting of upper and lower substantially rigid sleeve portions, means for securing said upper sleeve to the underside of a tundish while said lower sleeve remains removably insertable for vertical alignment between said upper sleeve and an underlying mold, a first annular flange annularly secured to the bottom of said upper sleeve, a second annular flange annularly secured to the top of said lower sleeve for vertical face engagement with said first annular flange when said lower sleeve is removably inserted by transversely positioning it into vertical alignment between said upper sleeve and an underlying mold, a third annular flange annularly secured to the bottom of said lower sleeve, a fourth annular flange, means for securing said fourth annular flange to an underlying mold for vertical face engagement with said third annular flange when said lower sleeve is removably inserted by transversely positioning it into vertical alignment



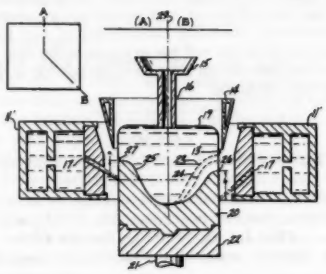
between said upper sleeve and an underlying mold, and vertical bias means mounted on the shrouding sleeve for continually urging at least one of said flanges into vertical face engagement with an engaged adjacent one of said flanges.

4,530,394

CONTROLLED WATER APPLICATION FOR ELECTROMAGNETIC CASTING SHAPE CONTROL

John C. Yarwood, Madison, and Derek E. Tyler, Cheshire, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 293,428, Aug. 17, 1981, abandoned, which is a continuation of Ser. No. 56,773, Jul. 11, 1979, abandoned. This application Oct. 31, 1983, Ser. No. 547,530
Int. Cl.³ B22D *27/02*
U.S. Cl. 164—467 **17 Claims**



1. In an apparatus for electromagnetically forming a molten material into a longitudinally extending casting defining a longitudinal axis thereof, said casting having a desired shape with at least one transverse portion of the outer peripheral surface of said casting extending transversely of said axis having a small radius of curvature, said apparatus including means extending transversely about said molten material for providing an electromagnetic containment force field acting on the outer peripheral surface of said molten material to form said desired shape, said apparatus including cooling means extending transversely about said molten material for applying coolant to the peripheral surface of said casting, the improvement wherein:

said cooling means include discharge port means for providing an unbaffled flow of coolant directly against said casting surface, said discharge port means in operation being substantially filled with coolant;

said discharge port means further comprising means for directing said coolant directly against said casting surface at each of said at least one transverse portion of the outer peripheral surface having a small radius of curvature at a first position with respect to said longitudinal axis and for directing said coolant directly against an adjacent transverse portion of said casting peripheral surface at a second position upstream of said first position;

whereby said coolant applied to said at least one transverse portion of said peripheral casting surface having a small radius of curvature provides an increased static pressure head of molten material as compared with the static pressure head of molten material at said adjacent transverse portion of said Peripheral casting surface so that said small radius of curvature can be formed.

13. In a process for electromagnetically forming molten material into a longitudinally extending casting defining a longitudinal axis thereof, said casting having a desired shape with at least one transverse portion of the outer peripheral surface of said casting extending transversely of said axis having a small radius of curvature, comprising the steps of:

providing an electromagnetic containment force field acting on the outer peripheral surface of said molten material to form said desired shape;

pouring said molten material into said electromagnetic force field;

providing a discharge port apparatus for applying an unbaffled flow of coolant directly against said casting surface wherein said discharge port in operation being substantially filled with said coolant; and

directing said coolant directly against said casting surface at each of said at least one transverse portion of the outer peripheral surface having a small radius of curvature at a first position with respect to said longitudinal axis and directing said coolant directly against an adjacent transverse portion of said outer peripheral surface at a second position upstream of said first portion whereby said coolant applied to said at least one transverse portion of said peripheral casting surface having a small radius of curvature provides an increased static pressure head of molten material as compared with the static pressure head of molten material at said adjacent transverse portion of said peripheral casting surface so that said small radius of curvature can be formed.

4,530,395

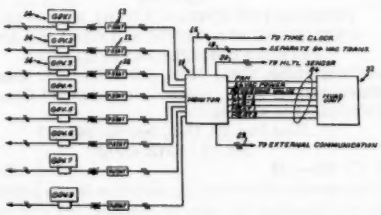
SINGLE ZONE HVAC CONTROLLED FOR OPERATION IN MULTIPLE ZONE ARRANGEMENT

Jeffrey L. Parker, and Edward Parker, both of Jacksonville, Fla., assignors to Parker Electronics, Inc., Jacksonville, Fla.

Continuation-in-part of Ser. No. 434,259, Oct. 14, 1982,. This application Dec. 29, 1982, Ser. No. 454,483

Int. Cl.³ F25B *29/00*; F24F *7/00*

U.S. Cl. 165—16 **45 Claims**



1. In a control system for monitoring and controlling the condition of air in each of a plurality of zones when using a single zone HVAC unit having a single supply air duct through which cool air or heated air is delivered into each zone, a thermostat means in each zone interfaced with and controlling a damper means in a duct supplying conditioned air to its respective zone and providing information to a control means, said control means including a monitor having a plurality of selectable control switches, said monitor being interfaced with the HVAC unit, each said thermostat means determining the condition of the air in its associated zone, said monitor activating the HVAC unit in accordance with the selected switches and the information provided from said zone theremostats to control the HVAC unit in the heating mode or cooling mode or ventilating mode.

4,530,396

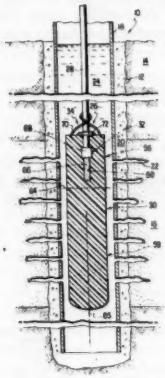
DEVICE FOR STIMULATING A SUBTERRANEAN FORMATION

Henry H. Mohaupt, 1151 Estrella Dr., Santa Barbara, Calif. 93110

Filed Apr. 8, 1983, Ser. No. 483,251

Int. Cl.³ E21B *29/02, 43/25*

U.S. Cl. 166—63 **10 Claims**



1. Apparatus for stimulating productivity of a subterranean formation comprising an elongate charge of propellent material for generating a large quantity of gaseous combustion products at an elevated pressure, the charge including a first region having a first rate of generating gaseous combustion products and a second region having a second rate of generating combustion products lower than the first rate; and means for igniting the first region, the first and second regions being of substantially identical composition and being an abutting, combustion-transferring relation.

4,530,397

OIL SAVING APPARATUS FOR USE WITH WELL PUMP POLISH ROD

Gloria J. Calhoun, Buttonwillow, Calif., assignor to H. C. Calhoun, a part interest

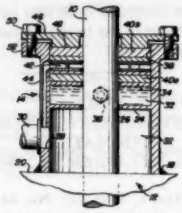
Filed Mar. 31, 1983, Ser. No. 480,763

Int. Cl.³ E21B *33/03, 33/08*

U.S. Cl. 166—84 **9 Claims**

1. Apparatus for use in conserving well fluid which may leak from a stuffing box or like seal past a well pump polish rod normally sealed by the stuffing box or the like, the apparatus comprising a housing having an open end for sealed attachment to a surface of the stuffing box or the like from which the polish rod emerges, with the housing surrounding the rod, the housing defining an internal collection chamber adjacent said open end for collecting said fluid, and an internal packing chamber having an opening at the opposite end of the housing, auxiliary packing in said packing chamber for sealing around the polish rod, a removable cover for said opening at the opposite end of the housing, the cover being formed with a

central polish rod opening and providing access to the packing when removed from the housing, primary discharge means for discharging fluid from said collection chamber to the exterior of the housing, secondary discharge means associated with the



packing chamber separate from the polish rod opening in the cover for collecting fluid which may pass through the collection chamber and discharging same therefrom, and means connecting the secondary discharge means with the primary discharge means externally of the collection chamber.

4,530,398

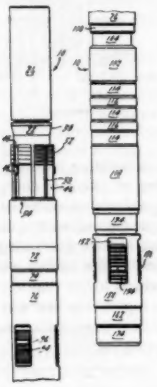
RETRIEVABLE WELL BORE PACKER

Donald R. Greenlee, and Albert E. Kline, both of Tulsa, Okla., assignors to Arrow Oil Tools, Inc., Tulsa, Okla.

Filed Aug. 2, 1982, Ser. No. 404,386

Int. Cl.³ F21B *23/06*

U.S. Cl. 166—123 **7 Claims**



1. A well packer for setting in a casing, said well packer comprising:

mandrel adapted to be interconnected to a setting tool;

a plurality of slips circumferentially spaced about a particular point of an axis of said mandrel for selective engagement with said casing;

drive means adapted to be axially moveable upon actuation of said setting tool to bear against the top of said slips;

lower inclined surfaces about said mandrel to bear against the bottom of said slips to slide between said slip and said mandrel when said drive means is moved relative to said mandrel by actuation of said setting tool;

a sleeve coaxially mounted with said mandrel with circumferentially spaced apertures in said sleeve sized to receive a respective one of said slips, said slips having case engaging means extending through said aperture; and

said apertures and said respective slips having differing relative dimensions to form varying clearances such that as when said sleeve is lifted relative to said mandrel, said sleeve sequentially releases one slip before the remaining slips.

4,530,399

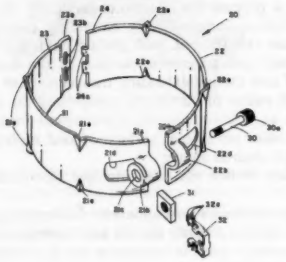
STOP DEVICE FOR WELL CONDUIT

Harry W. Riddle, San Antonio, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Oct. 31, 1983, Ser. No. 546,937

Int. Cl.³ E21B *37/00*

U.S. Cl. 166—173 **2 Claims**



1. A stop device adapted to be mounted on a conduit to be disposed in a subterranean well comprising: a pair of semi-annular metallic band elements; notch means on the one end of one said semi-annular band element; hook means on the one end of the other said semi-annular band element and cooperable with said notch means to pivotally secure together the respective one ends of said semi-annular band elements, whereby the other ends of said semi-annular band elements may be moved away from each other to encompass a well conduit and moved toward each other to exert a clamping force on the encompassed well conduit; and adjustable means for urging said other ends of said semi-annular band elements toward each other, thereby clamping said stop device to the well conduit; said one end of said one semi-annular band element containing said notch means being radially outwardly offset from the remainder of said one semi-annular band element, and said hook means is generally radially disposed relative to the remainder of said other semi-annular band element.

4,530,400

PROCESS FOR ENHANCED OIL RECOVERY EMPLOYING SYNTHETIC SULFONATES AND PETROLEUM SULFONATE BLENDS

Wen-Ching Hsieh, Chino Hills, and Jeffery W. Koepke, La Habra, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Dec. 27, 1983, Ser. No. 565,237

Int. Cl.³ E21B *43/16*

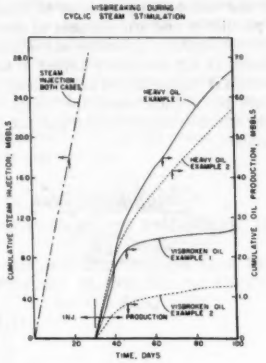
U.S. Cl. 166—273 **41 Claims**

1. In a method for recovering petroleum from a subterranean reservoir including the steps of injecting into said reservoir through an injection well a micellar displacement fluid comprising a micellar solution and mobility buffer, and thereafter injecting an aqueous flooding medium to drive said micellar displacement system towards a spaced production well from which fluids are recovered, the improvement which comprises injecting into the reservoir a micellar solution comprising a liquid hydrocarbon, a brine and a surfactant comprising an alkylaromatic synthetic sulfonate.

4,530,401
METHOD FOR MAXIMUM IN-SITU VISBREAKING OF HEAVY OIL

Kathy J. Hartman, Arlington, and Winston R. Shu, Dallas, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 5, 1982, Ser. No. 365,844
Int. Cl.³ E21B *43/24*
U.S. Cl. 166—303 3 Claims



1. A method of recovering viscous oil from a subterranean, viscous oil-containing formation containing no underlying water zone, comprising:

(a) penetrating said formation with at least one well in fluid communication with at least 80% of the vertical thickness of said formation;

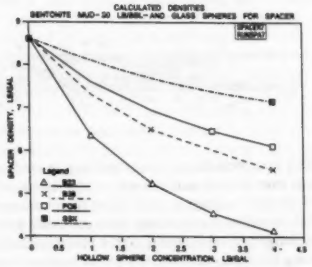
(b) injecting steam into the formation via said well at a temperature within the range of 500° to 650° F. and an injection rate of 1 to 35 barrels of steam (cold water equivalent) per day until 70 to 700 barrels of steam per foot of oil-containing formation thickness has been injected thereby effecting maximum visbreaking of the oil in said formation; and

(c) recovering fluids including mobile oil and visbroken oil from said formation via said well.

4,530,402
LOW DENSITY SPACER FLUID

Robert C. Smith, Inola, and George B. Holman, Jr., Tulsa, both of Okla., assignors to Standard Oil Company, Chicago, Ill.

Filed Aug. 30, 1983, Ser. No. 527,902
Int. Cl.³ E21B *33/13, 37/00*
U.S. Cl. 166—291 17 Claims



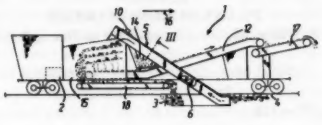
13. A low density spacer fluid for introduction into a wellbore, consisting essentially of:

a nonagglomerating carrying fluid and a dispersion therein of discrete dispersible density reducing bodies.

4,530,403
BALLAST CLEANING MACHINE

Josef Theurer, Vienna; Karl Fölser, and Friedrich Oellerer, both of Linz, all of Austria, assignors to Franz Plasser Baumaschinen Industriegesellschaft M.B.H, Vienna, Austria

Filed Jan. 25, 1983, Ser. No. 460,893
Claims priority, application Austria, Mar. 10, 1982, 959/82
Int. Cl.³ E01B *27/00*
U.S. Cl. 171—16 6 Claims



1. A mobile ballast cleaning machine comprising

(a) ballast excavating and receiving means including an endless ballast conveying chain movable in a conveying direction, the chain having arranged sequentially in the conveying direction

(1) a transverse chain section for excavating the ballast,

(2) an upwardly extending elongated chain section for conveying the excavated ballast, the upwardly extending elongated chain section being supported in a guide of channel-shaped cross section and having a bottom defining a plurality of ports for pre-screening the conveyed ballast to separate waste therefrom falling through the ports in the bottom, and

(3) a descending elongated chain section leading to the transverse chain section,

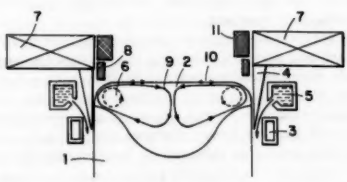
(b) a vibratory screening means arranged to receive the pre-screened ballast from the upwardly extending elongated chain section to separate residual waste therefrom, a cleaned ballast component remaining on the screening means and the residual waste falling therethrough, and

(c) conveying means for conveying the waste away, the conveying means comprising a waste conveyor band having a waste receiving portion arranged below the vibratory screening means, and the ports in the bottom of the guide being arranged above the waste conveyor band.

4,530,404
PROCESS FOR THE ELECTROMAGNETIC CASTING OF METALS INVOLVING THE USE OF AT LEAST ONE MAGNETIC FIELD WHICH DIFFERS FROM THE FIELD OF CONFINEMENT

Charles Vives, Chateaurenard, France, assignor to Aluminium Pechiney, Paris, France

Filed Jul. 7, 1983, Ser. No. 511,397
Int. Cl.³ B22D *27/02*
U.S. Cl. 164—467 7 Claims



1. In a process for the electromagnetic casting of metals

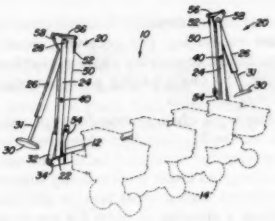
wherein an electromagnetic confinement field acts on molten metal in the course of solidification to contain and form said molten metal into a desired casting, the improvement comprising the steps of applying a stationary field to said molten metal, said stationary field being generated by an annular coil supplied with direct current, and simultaneously applying a variable field to said molten metal, said variable field being generated by an annular coil supplied with alternating current, said fields being applied to the molten metal to produce radial vibrations within the metal during solidification and to limit the agitation of the molten metal, thereby improving the structure and surface condition of the cast metal.

4,530,405

PLANTER ROW MARKER

Gregory S. White, Moline, Ill., assignor to Deere & Co., Moline, Ill.

Filed Mar. 23, 1984, Ser. No. 592,521
Int. Cl.³ A01B *69/02*
U.S. Cl. 172—126 **2 Claims**



1. In a row marker for use in conjunction with a planting implement including a plurality of planting units attached to a frame, a foldable support arm attached to the frame, a marker disk blade attached to the end of the vertically foldable support arm, a hydraulic cylinder interconnecting the frame and an inner link of the foldable support arm for selectively moving the row marker between a raised position and a lowered working position, and a cable interconnecting the frame and an outer link of the foldable support arm for selectively extending the outer link when the row marker moves toward its lowered working position, the improvement comprising:

an inner link arm having a slot to receive an end pin carried by the hydraulic cylinder, said slot being disposed to slideably receive said end pin and being defined by a path generally longitudinal to the inner link and having a generally transverse hooked portion at the outer end thereof.

4,530,406

SPRING CLAMP SHANK ASSEMBLY

Kenneth A. Hake, Tipton, and Gregory A. Hamilton, Beloit, both of Kans., assignors to Kent Manufacturing Co., Inc., Tipton, Kans.

Filed May 2, 1983, Ser. No. 490,831
Int. Cl.³ A01B *61/04, 35/24*
U.S. Cl. 172—705 **3 Claims**

1. A cultivating tool assembly for attachment to the tool bar of a cultivator frame and comprising:

(a) a substantially vertical mounting bracket having a forward end plate for fastening to said tool bar and spaced side plates extending rearwardly from said end plate, said side plates having upper and lower portions;

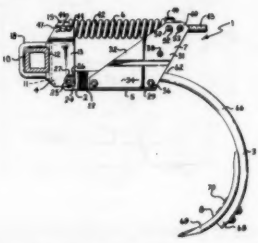
(b) an arm member having a forward end pivotally mounted to said bracket lower portions and having a rearward portion extending substantially horizontally therefrom;

(c) a cradle member including spaced side walls mounted to and extending upwardly from said arm member rearward portion; said cradle member having an upper portion spaced above said arm member a distance generally equal to a distance between said bracket upper and lower portions;

(d) a control rod having a forward end pivotally mounted to said bracket upper portions and having a threaded rearward portion extending generally horizontally therefrom and parallel to said arm member;

(e) a bushing pivotally mounted to said cradle member upper portion with said control rod extending reciprocably therethrough, said control rod being mounted to said bracket and said bushing so as to be continuously positioned parallel to said arm member as said tool assembly intermittently deflects upwardly and downwardly;

(f) an adjustment nut threadably affixed to said control rod and positioned rearwardly of said bushing, said nut being selectively positionable along the length of said rod to adjust the effective length thereof and raise and lower said arm member;



(g) a coil spring sleeved about said control rod and positioned between said bracket and said cradle member, said spring biasing said cradle member outwardly with said bushing against said nut for absorbing upward shock transients imparted to said arm member; and

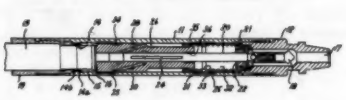
(h) a tool shank having an elongate, generally horizontally extending upper end secured to said arm member and extending parallel thereto, and elongate and substantially semi-circular mid portion extending from said arm member and curving rearwardly, downwardly and forwardly, and a lower end having a tool tip attached thereto and positioned generally under said cradle member; whereby said tool shank tends to push forwardly and downwardly on said tool tip during use while providing a substantial ability to deflect upwardly and trip over obstacles.

4,530,407

FLUID OPERATED HAMMER

Ian G. Rear, 53 Louise St., Nedlands, Australia

Filed Sep. 17, 1981, Ser. No. 302,999
Int. Cl.³ E21B *1/06*
U.S. Cl. 173—17 **8 Claims**



1. A fluid operated hammer comprising; a casing, a top sub mounted at one end of said casing; a drill bit mounted at the other end of said casing; a feed tube located concentrically within said casing and extending from said one end for a portion of the length of said casing; and a piston slidably mounted in the casing for longitudinal movement between said top sub and said drill bit and having a central bore received over said feed tube; said feed tube being formed with one elongate aperture having its longitudinal axis parallel with the longitudinal axis of the feed tube; the portion of said piston adjacent said top

sub being of reduced diameter; a first annular rib formed on said reduced diameter portion of said piston; a second annular rib formed on the internal face of said casing positioned to be slidingly and sealingly engaged by said first rib at an intermediate position of said piston in said casing; to define a reservoir space between the external cylindrical face of said reduced diameter portion of said piston and the internal face of said casing; a first passageway interconnecting said internal bore of said piston and the external face of the reduced diameter portion of said piston wherein when at said intermediate position fluid from said aperture is admitted to said reservoir space and on movement of the piston towards said top sub from said intermediate position said reservoir space opens into the space between the top sub and the adjacent end of said piston; and a second passageway interconnecting said internal bore of said piston with the external face of said piston for providing communication between said aperture and the space between said drill bit and the adjacent end of said piston when said piston is closely adjacent said drill bit.

4,530,408

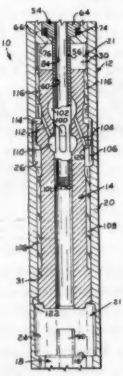
PORTING SYSTEM FOR PNEUMATIC IMPACT HAMMER

Roland J. Toutant, Rte. 193, Thompson, Conn. 06277

Filed Mar. 28, 1983, Ser. No. 479,716

Int. Cl.³ B23Q *5/033*

U.S. Cl. 173—17 **22 Claims**



1. In a downhole drill comprising a drill bit impact hammer having an elongated tubular casing with an axial through bore and an intermediate section providing an impact piston operating cylinder, an impact piston with a coaxial through bore mounted for axial reciprocation within the operating cylinder, and fluid conductor means mounted within one end of the casing for coupling the downhole drill to and receiving pneumatic pressure fluid from a drill string and comprising an elongated pressure fluid delivery tube extending coaxially within one end of the piston operating cylinder corresponding to said one end of the casing and sealingly received within the piston bore at a corresponding one end of the piston, the pressure fluid delivery tube having peripheral outlet port means for the delivery of pressure fluid for sequential supply to the opposite ends of the piston operating cylinder for and upon reciprocation of the piston, the impact piston having a non-impact end face at its said one end and an impact end face at its other end; and a drill bit having an inner end mounted within the casing at the other end of the piston operating cylinder from said delivery tube for impact by the impact end face of the piston, the drill bit having an exhaust conduit with an exhaust tube adapted for receipt within and withdrawal from the piston bore at said other end of the piston for selectively connecting said other end of the piston operating cylinder to exhaust for and upon reciprocation of the piston; the hammer having fluid passageway means to automatically supply pressure fluid from the peripheral outlet port means of the delivery tube sequentially to the opposite ends of the piston operating cylinder for and upon reciprocation of the piston and to selectively and automatically connect said one end of the piston operating cylinder to the exhaust conduit, via the piston bore at said other end of the piston and the exhaust tube, for and upon reciprocation of the piston, said fluid passageway means comprising first and second separate, axially spaced, inner annular grooves in the piston opening into the piston bore; the improvemment wherein said fluid passageway means comprises first and second separate, axially spaced peripheral groove means in the piston which include first and second separate, axially spaced peripheral annular grooves respectively in the piston, the said second annular groove providing a nonexhausted pressure fluid chamber, and first and second separate internal passage means in the piston interconnecting said first and second inner annular grooves respectively with said first and second peripheral annular groove respectively said first peripheral groove means and said second inner annular groove being disposed axially closer to the non-impact end face of the piston than said second peripheral groove means and said first inner annular groove respectively, said first inner annular groove and said first peripheral groove means being located to alternately connect said one end of the piston operating cylinder, via said first peripheral annular groove, to receive pressure fluid from said peripheral outlet port means and to exhaust via the piston bore at said other end of the piston for and upon reciprocation of the piston, the piston having first and second separate, axially spaced, peripheral sealing sections for sealing engagement with said intermediate section of the casing, said first peripheral sealing section being disposed between said first and second separate peripheral groove means and said second peripheral sealing section being disposed toward the impact end face of the piston from said second peripheral groove means, said fluid passageway means further comprising first and second separate, internal, axially spaced bypass grooves in said intermediate section of the casing cooperating with said first and second peripheral sealing sections respectively to sequentially supply pressure fluid from said peripheral outlet port means via said second inner annular groove, said second internal passage means, said second peripheral groove means, including said second peripheral annular groove, and said first and second bypass grooves to the opposite ends of the piston operating cylinder, when the said opposite ends respectively of the piston operating cylinder are not connected to exhaust, for and upon reciprocation of the piston.

4,530,409

OFFSET DRIVER ACCESSORY

Satya P. Arya, San Jose, Calif., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation-in-part of Ser. No. 084,668, Oct. 15, 1979, Pat. No. 4,327,806. This application Mar. 17, 1982, Ser. No. 358,864

The portion of the term of this patent subsequent to May 4, 1999, has been disclaimed.

Int. Cl.³ B25D *17/00;* **E21D** *20/00*

U.S. Cl. 173—131 **8 Claims**

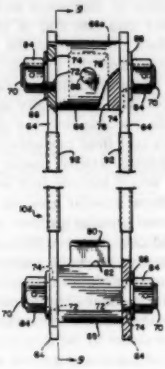
1. An offset driver accessory, for inserting friction rock stabilizers in earth bores, comprising:

rigid, elongate bars of a given length, and of substantially straight configurations from end to end thereof;

first means, having a directly-engaged mechanical connection with said bars, adjacent to one end of each, for engaging an end of a friction rock stabilizer; and

second means, also having a directly-engaged mechanical connection with said bars, adjacent to the opposite ends thereof, for receiving a friction rock stabilizer insertion tool whereby, upon any insertion forces being addressed to said second means, such forces are directly communicated to said bars and, therethrough, directly to said first means; and wherein

said first means comprises means which defines a land for engaging an end of a friction rock stabilizer; and



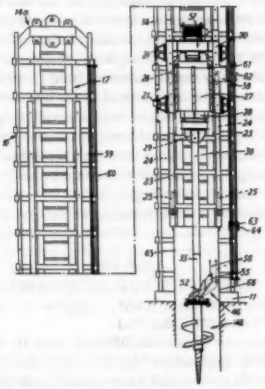
at least one of said first and second means is pivotably coupled to said bars.

4,530,410

HOLE BORING APPARATUS AND METHOD

William E. Kay, 15 Bramley Rd., East Peckham, Near Tonbridge, Kent, England

Filed Nov. 29, 1982, Ser. No. 445,173
Int. Cl.³ E21B *7/00, 10/44*
U.S. Cl. 175—57 **17 Claims**



1. Apparatus for boring a hole comprising an elongate bar, means for rotating the bar about its lengthwise axis, an auger surrounding the bar which auger is slidable lengthwise of the bar but is not rotatable relative to the bar, a carrier which is slidable along the bar and which is free for rotation relative to the bar, a connection connecting the carrier to the auger, permitting rotation of the auger relative to the carrier, means, disposed on the carrier and selectively movable outward relative to said axis, for engaging the wall of the hole or a liner of the hole to limit the extent of rotation of the carrier about said axis and back from engagement with the wall towards said axis, and means for raising and lowering the carrier along the bar.

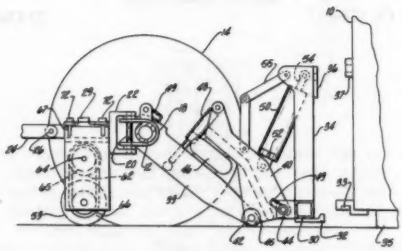
16. A method of boring a hole in a ground comprising the steps of: lowering along a vertical bar which is capable of boring into the ground, an assembly comprising an auger and a carrier therefor until the auger reaches the ground, the carrier and the auger being mounted on and concentrically with the bar, the carrier being free for rotation relative to the bar and the auger, and the auger being suspended from the carrier and in driven engagement with the bar; moving a device on the carrier radially outward into engagement with the wall of the hole or a liner of the hole to prevent the carrier from rotating in the hole; causing the bar and auger to rotate to collect spoil and, when the auger has collected a quantity of spoil, moving the device back inward out of engagement with the wall or liner; and causing the carrier, with the auger suspended therefrom, to be hoisted along the bar.

4,530,411

MOTORIZED WHEELS FOR DOLLY STRUCTURES

Israel M. Grinwald, Oakland, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 18, 1983, Ser. No. 514,984
Int. Cl.³ B62D *59/04*
U.S. Cl. 180—11 **7 Claims**

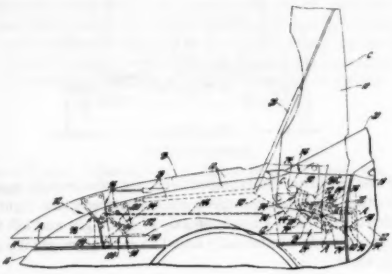


1. In a two-wheel dolly for lifting and towing an upright shelter unit, said dolly comprising an axle, two road wheels at opposite ends of the axle, a central steering link pivotably connected to the axle at a point midway between the road wheels, said link having a pivot axis extending normal to the axle whereby the link is normally swingable in a horizontal plane, tie rods extending between the road wheels and steering link for translating swinging movement of the link into steering adjustments of the road wheels, a towbar extending from the steering link for connection to a towing vehicle, bracket means for connecting the dolly unit to the shelter unit, said bracket means including a lifting bar extending parallel to the axle for positionment near an end wall of a shelter unit, said lifting bar having laterally spaced lifter elements projecting therefrom for engagement with lift surfaces on a shelter unit, laterally spaced suspension arm structures extending from the axle to the lifting bar, and fluid cylinder means trained between the suspension arms structures and bracket means for enabling the lifter bar to exert a lift action on the shelter unit: the improvement comprising a motorized wheel assembly mountable on the steering link to facilitate movement of the dolly unit to a position wherein its lifter elements are directly below the lift surfaces on the shelter unit; said motorized wheel assembly comprising a yoke structure that includes two laterally spaced arms extending downwardly relative to the steering link, a ground wheel carried within the yoke structure, said ground wheel having an axle extending between the spaced arms near their lower ends, a fluid-operated motor mounted between said arms in the space between the steering link and ground wheel, and drive-transmitting means between the motor and the axle of the ground wheel.

4,530,412
VEHICLE HOOD SUPPORT AND SECONDARY LATCH

Stephen Sigety, Jr., Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 12, 1984, Ser. No. 599,687
Int. Cl.[3] B62D 25/10
U.S. Cl. 180—69.21 3 Claims



1. A combination guiding support and secondary latch means for use in combination with a vehicle closure or the like having a first portion hingedly supported to the vehicle and resiliently biased to move the closure longitudinally forwardly and vertically upwardly of the vehicle, upon release of a primary latch means, from a closed to an intermediate open position, comprising,

a guiding member joined to the vehicle at a location longitudinally spaced from the closure first portion and having a guide slot therein extending longitudinally and vertically upwardly relative to the vehicle to an open end,

a latch member joined to the closure and slidably movable within the guide slot to the open end thereof to guide and support the closure, in combination with the hinge support of said first portion, as the closure moves from the closed to the intermediate open position upon release of the primary latch means,

said secondary latch means being cooperable with the guide member to releasably maintain the closure to the vehicle in the intermediate open position, and including keeper lever having a first end pivoted to the guiding member and a second end swingable in an arc from a first point in the guide slot to a second point at the open end of the guide slot,

the keeper lever second end further including a clearance slot in which the latch member is receivable and intersecting the guide slot as the keeper lever moves at all points of the arc, and having a radially outermost slot end coincident with the open end of the guide slot at the second point of the arc when the closure is in the intermediate open position,

biasing means acting between the guide member and the keeper lever to resiliently urge the keeper lever toward the second point of the arc to maintain an edge of the clearance slot engaged with the latch member as the closure moves from the closed to the intermediate open position,

the keeper lever second end further including an open keeper slot in which the latch member is receivable and extending generally normal to the clearance slot from the radial outermost end thereof, the radial outermost edge of the keeper slot defining a keeper surface extending a first distance over the latching member at the second point of the arc to maintain the closure latched to the vehicle at the intermediate open position, with the other edge of the keeper slot extending a greater second distance beneath the latching member to define a guiding surface, and

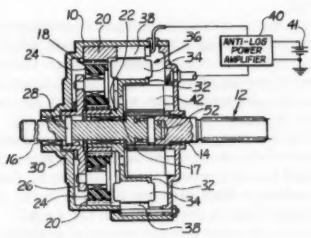
the keeper lever second end further including a striker surface sloped toward the guiding surface of the keeper slot and terminating at the keeper surface,

whereby movement of the keeper lever back toward the first point of the arc against the urging of the biasing means clears the keeper surface from the latching member to allow the closure to move further vertically upward relative to the vehicle from the intermediate open position, and movement of the closure back toward the intermediate open position slidably moves the latching member past the striker surface against the urging of the biasing means until the latching member hits the guiding surface of the keeper slot and the biasing means moves the keeper surface back over the latching member, and movement of the closure back toward the closed position carries the keeper lever with the latching member back to the first point of the arc until the primary latch means may be re-engaged.

4,530,413
ELECTRICAL POWER ASSISTED STEERING MECHANISM

James W. Buike, Union Lake, and Ambrose Tomala, Royal Oak, both of Mich., assignors to Allied Corporation, N.Y.

Filed May 5, 1983, Ser. No. 491,947
Int. Cl.[3] B62D 5/04
U.S. Cl. 180—79.1 34 Claims



1. An improved electrically assisted power steering mechanism for an automotive vehicle having an input member adapted to be connected to the vehicle's steering wheel, an output member adapted to be connected to the vehicle's steering mechanism, a torsion member interconnecting the input and output members, a torque sensor generating a torque signal having a first component indicative of the magnitude of the applied torque between the input and output members and a second component indicative of the direction of the applied torque, a power amplifier for activating an electric motor in response to the torque signal, and a gear train interconnecting the output of the electric motor with the output member, to assist the driver in turning the wheels of the vehicle, said improvement characterized by:

power amplifier means responsive to said first and second components of said torque signal for generating an amplified signal having a magnitude component which varies as a function of the first component and having a direction component indicative of said second component;

a low speed high torque reversible electric motor for generating a rotary output having a magnitude and direction indicative of said amplified signal; and

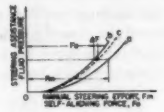
a gear train having an output to input gear ratio between 1:1 and 10:1 for transmitting the rotary output of the electric motor to the output member.

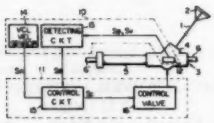
4,530,414

STEERING ASSISTANCE PRESSURE CONTROL APPARATUS

Masato Fukino, Yokohama; Tokiyoshi Yanai, Yokosuka; Hirotsugu Yamaguchi, Chigasaki, and Yutaka Aoyama, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 1, 1983, Ser. No. 471,190
Claims priority, application Japan, Mar. 30, 1982, 57-51875
Int. Cl.³ B62D *5/06*
U.S. Cl. 180—142 **12 Claims**





1. A steering pressure control apparatus for a power-assisted steering system for a vehicle including a steering shaft, a steering wheel rotatable with the steering shaft and a steering power cylinder to develop a steering assistance fluid pressure, comprising:

detecting means operative to detect a predetermined state in which the steering wheel is held in an angular position turned from the straight-ahead position thereof through an angle smaller than a predetermined value and to produce an output signal when said predetermined state is detected; and

control means responsive to said output signal and operative to control the steering assistance fluid pressure to be developed in said steering power cylinder so that the steering assistance fluid pressure is lower in the presence of said signal than in the absence of the signal.

3. A steering pressure control apparatus as set forth in claim 1 or 2, in which said detecting means comprises vehicle-speed sensor means operative to detect driving speed of the vehicle and to produce an output signal representative of the detected vehicle speed and in which said control means is operative to control said steering assistance fluid pressure in such a manner that the fluid pressure varies with said output signal.

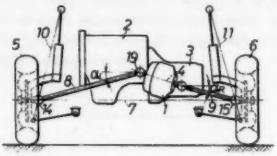
4,530,415

POWER TRANSMISSION DEVICE FOR FRONT-ENGINE FRONT-DRIVE CAR

Mamoru Sakata, Ooizumigakuen, and Masaaki Minakawa, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 428,646
Claims priority, application Japan, Mar. 24, 1982, 57-46968
Int. Cl.³ B60K *17/30*
U.S. Cl. 180—297 **8 Claims**

1. In a front-engine front drive car having a power unit proper including an engine and a transmission installed in a front part of the car, a power transmission device comprising right and left drive shafts of different lengths adapted to be driven by said transmission through a differential gear mechanism having an output shaft, for driving right and left front wheels of said car, respectively, said differential gear mechanism being laterally offset from a central longitudinal axis of said car wherein the one of said right and left drive shafts which is located on the same side of said central longitudinal axis of said car as said differential gear mechanism is axially aligned with respect to the center line of said output shaft of said differential gear mechanism, and the center line of said output shaft of said differential gear mechanism is vertically and longitudinally inclined so that the descent angles of said



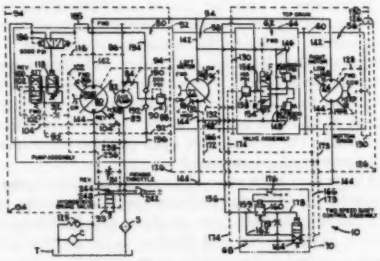
right and left drive shafts respectively are substantially equal to each other, and the respective angles between said right and left drive shafts and a common axis of said right and left front wheels are made substantially equal to each other as viewed in a plan view.

4,530,416

HYDROSTATIC PROPULSION SYSTEM AND METHOD WITH INCHING THROTTLE AND BRAKE

Denes P. Kassai, Chino, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed May 23, 1983, Ser. No. 497,397
Int. Cl.³ F16H *39/46*
U.S. Cl. 180—307 **7 Claims**



1. A hydrostatic propulsion system for a vehicle such as a mobile sweeper or the like having driven wheels, comprising:

means defining a main power driven positive displacement swash plate pump including pistons and having forward and reverse pump stroking means for varying the position of the swash plate between zero piston displacement to full forward or full reverse piston displacement;

means defining at least one swash plate motor operatively connected to said pump and to at least one driven wheel and having low speed and high speed motor stroking means for varying the position of the motor swash plate betwewen an initial high piston displacement low speed position and a low piston displacement high speed position;

means defining a pump stroking valve;

means for providing and maintaining hydraulic fluid in said main pump and in said motor;

operator controlled shift means for moving said stroking valve between a neutral position and at least one pump selected operative position;

inching throttle valve means movable between a fully open position and a fully closed position and in fluid communication with both of said pump stroking means and said stroking valve;

operator controlled accelerator means for moving said throttle valve means between a fully open position and

said fully closed position for progressively moving said pump stroking means between zero piston displacement and a positive piston displacement when said pump stroking valve is in said selected operative position for driving the vehicle in the selected direction;

a hydrostatic brake valve connected in parallel with said inching valve and movable between a normal fully closed position and an open position, and

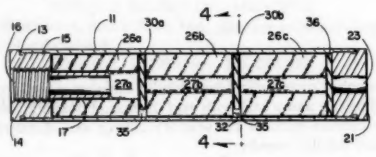
a manually operated brake pedal operatively connected to said brake valve for shifting the valve to said open position upon initial movement of said pedal for balancing the fluid pressure acting on both of said pump stroking means for providing a hydrostatic braking force to the vehicle.

4,530,417

SUPPRESSOR

Wayne Daniel, Atlanta, Ga., assignor to SW Daniel, Inc., Atlanta, Ga.

Filed Jun. 22, 1983, Ser. No. 506,812
Int. Cl.³ F41C *21/18*
U.S. Cl. 181—223 **7 Claims**



1. Sound suppressor apparatus for use with firearms, comprising:

a tubular housing attachable to the muzzle end of a firearm and defining a hollow interior surrounding a path along which bullets can travel;

plural elements of absorbent material disposed along the hollow interior of said housing, in surrounding relation with said bullet path, said absorbent material operative to receive propellant gases in the bullet path;

a fluid-impervious baffle between at least two adjacent elements of absorbent material and covering substantially less than the entire end area of said adjacent elements, leaving the uncovered end area portions exposed to permit passage of gas therethrough, thereby increasing the absorption of propellant bases and attendant reduction in energy of the gases;

each said fluid-impervious baffle having substantially a triangular shape and having a plurality of discrete radial extremities which contact the inside of said tubular housing and maintain said baffle centrally located across the hollow interior of the housing; and

each baffle having noncircular outer edges extending between said radial extremities and spaced radially inwardly from said extremities, so that the regions between said noncircular outer edges and the inside of the tubular housing are unoccupied by the baffle and thereby leave uncovered the adjacent end portions of said absorbent elements, allowing the gases to flow through the uncovered end portions and thereby increasing the reduction in the energy in the gases.

4,530,418

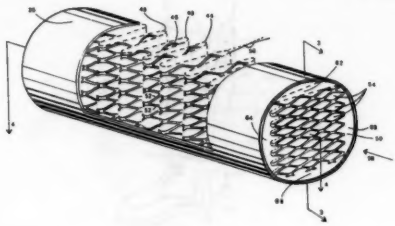
AUTOMOTIVE EXHAUST SYSTEM

Neil L. Currie, 47 Whitehall Rd., Toronto, Ontario, Canada

Continuation of Ser. No. 384,041, Jun. 1, 1982, abandoned. This application Sep. 27, 1984, Ser. No. 655,986
Int. Cl.³ F01N *1/24*
U.S. Cl. 181—227 **31 Claims**

1. An exhaust system for exhausting gases from an internal combustion engine having an exhaust manifold on a vehicle, the engine being capable of conventional muffling by at least one muffler section positioned along the length of an exhaust pipe extending from the exhaust manifold to the atmosphere, the muffler section having a larger diameter than the diameter of the exhaust pipe, comprising:

a uniform diameter pipe having a diameter approximately that of the exhaust pipe for conventional muffling extending from the engine exhaust manifold to an opening to the



atmosphere, the pipe carrying the exhaust gases from the engine to the atmosphere; and

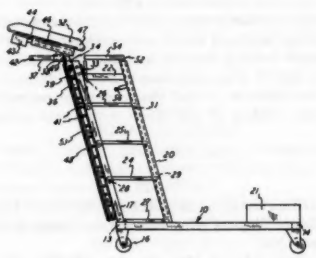
a plurality of expanded, porous material filters positioned within the pipe along its length to muffle the noise of the exhaust, said filters being formed of at least one element of porous material, said element being folded at preselected positions along the length of said element to form individual filters between the folds with each filter spaced a predetermined distance from the proximate filters.

4,530,419

COMBINED STANDING AND BODY SUPPORT FOR A PERSON

Donald V. Rumage, and Terry L. Biarnesen, both of Racine, Wis., assignors to Donald V. Rumage, Racine, Wis.

Filed Apr. 29, 1983, Ser. No. 489,725
Int. Cl.³ B25H *5/00*
U.S. Cl. 182—106 **17 Claims**

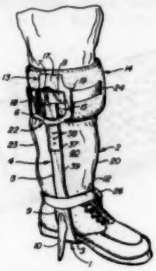


1. A ladder with an extendible body support, comprising a base frame, a super structure mounted on said base frame and extending thereabove, ladder platforms spaced along said super structure for supporting a person in a standing position at selected elevations, a body support on the upper end of said super structure, a first slidable interconnector interposed between said body support and said super structure for selective vertical positioning of said body support relative to said super structure, a second slidable interconnector interposed between said body support and said super structure for horizontal positioning of said body support relative to said super structure along one horizontal line, and a third slidable interconnector interposed between said body support and said super structure for horizontal positioning of said body support relative to said super structure along another horizontal line.

4,530,420
LEG PROTECTOR AND SOCKET FOR CLIMBERS

Edwin L. Hobbs, 10 Lance Ct., Moraga, Calif. 94556

Filed Aug. 31, 1984, Ser. No. 646,895
Int. Cl.[3] A63B 27/02
U.S. Cl. 182—221 5 Claims



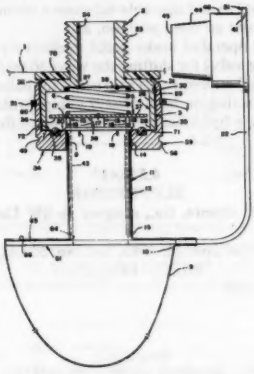
1. A climber for a workperson comprising:
a. a stirrup member adapted for receipt of the instep of said workperson's foot;
b. a shank member connected to said stirrup member at a generally right angle having an elongated member, an upper end and a loop member attached to said upper end;
c. a gaff member connected to the lower end of said shank member adjacent said stirrup member adapted for piercing a wooden member;
d. a rigid socket member including a base member, an end member projecting from said base member, an upper holding member spaced from said base member, a pair of strap openings adapted for threadable engagement with a strap member and a lower holding member spaced from said base member;
e. a foam pad member connected to said rigid socket member, formed for partially encapsulating a portion of the inner leg of said workperson;
f. an upper leg strap member threadably inserted through said loop member on said shank member and said pair of strap openings in said socket member;
g. a foot strap member connected to said stirrup member and encircling the lower leg of said workperson; and
h. said upper holding member and said lower holding member are spaced from said base member a distance greater than the thickness of said shank member permitting limited axial rotation of said shank within said socket member.

4,530,421
OIL DRAINAGE AND COLLECTION SYSTEM

Duane C. Balch, Napa, Calif., assignor to Chartwell Corporation, Napa, Calif.

Filed Mar. 7, 1984, Ser. No. 587,228
Int. Cl.[3] F01M 11/04; F16K 51/00
U.S. Cl. 184—1.5 6 Claims

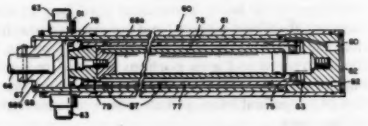
1. A system for draining and collecting used oil from an engine crank case having a threaded opening comprising:
a. a drain valve threadably connected to said crank case opening having a housing, a valve chamber formed therein, a valve member mounted in said chamber, spring means normally biasing said valve member to a closed position, seat means sealably receiving said valve member and an internal cylindrical wall forming a discharge opening operably connected to said valve chamber;
b. receptacle means dimensioned for receiving the used oil from said crank case and formed with an opening therein;
c. a valve actuator formed with a tubular member connected to said receptacle means at one end and having a distal end dimensioned for close fitting insertion through said discharge opening in said valve housing and having a contact member connected to said distal end of said tubular member for engaging said valve member for movement against said spring means, and formed with an annular sealing member surrounding said tubular member which forms a coupling and a seal with said discharge opening; and
d. a closure member for sealably closing said distal end of said tubular member.



4,530,422
SPREAD BRAKE CYLINDER DEVICE

Thomas M. Bogenschutz, Clayton, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Division of Ser. No. 300,829, Sep. 10, 1981, Pat. No. 4,420,066.
This application Sep. 22, 1983, Ser. No. 534,873
Int. Cl.[3] B60T 17/16; B61H 13/22; F16D 65/24
U.S. Cl. 188—52 5 Claims



1. A spread brake cylinder device adaped to be suspended horizontally between two levers associated with braking rigging for wheels on one side of a railway truck for applying substantially equal braking pressure to the treads of both of the wheels comprising:
(a) a cylindrical housing adapted to be connected to one of the levers,
(b) a push rod having a tubular push rod portion at one end thereof extending coaxially within the cylindrical housing and having its other end extending out of the cylindrical housing for connection to the other lever.
(c) a piston at an intermediate point in the push rod adjoining a fluid pressure chamber within the inner periphery of the tubular portion of the push rod for axially actuating the push rod, and
(d) locking means within the tubular push rod portion for selectively preventing retraction of the tubular push rod portion within the cylindrical housing, even though pressure in the fluid pressure chamber may be reduced,
(1) the locking means within the tubular push rod portion comprising a fixed lock rod secured at one end to the cylindrical housing and having a conical wedge in a fixed position at the other end thereof, and
(2) roller means for providing a wedging connection be-

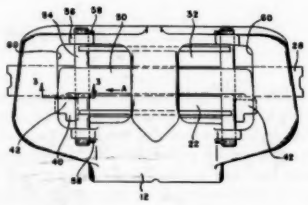
tween the inner periphery of the tubular push rod portion of the push rod and the conical wedge when moved axially relative to the fixed position of the wedge, wherein the roller means comprises rollers retained in a cage at one end of a tubular axially moveable lock rod within the tubular push rod portion, and a locking piston is secured in the other end of the tubular axially moveable lock rod subject to fluid actuation in one direction for rendering the locking means effective and subject to fluid actuation in the opposite direction to unlock the locking means.

4,530,423

DISC BRAKE INCLUDING TIE BAR ON STATIONARY TORQUE RECEIVING MEMBER

Irving R. Ritsema, South Bend, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed Oct. 3, 1983, Ser. No. 538,398
Int. Cl.³ F16D 65/02
U.S. Cl. 188—73.39 **5 Claims**



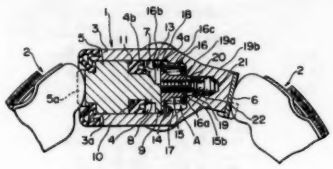
1. A disc brake having a caliper movably supported by a torque member and cooperating with a pair of friction elements to urge the latter into engagement with a rotor during braking, the torque member defining a first portion extending radially to a position outside an outermost radial edge of the rotor and a second portion extending axially over the outermost radial edge of the rotor, the first portion forming a recess circumferentially separating a pair of arms of the torque member from each other in order to receive an actuator portion of the caliper within the recess and the second portion forming a pair of flanges connected, respectively, with the pair of arms and also cooperating, indirectly, with at least one of the pair of friction elements to oppose rotation of the one friction element, characterized in that the torque member first portion is on one side of the rotor and the torque member further defines a tie bar extending circumferentially between said pair of flanges at a radial location beyond the outermost radial edge of the rotor, said tie bar connecting said pair of flanges to oppose movement between said pair of flanges and cooperating with said pair of flanges to define a pair of apertures substantially at connections between said tie bar and said pair of flanges, and a pair of pins being disposed within said pair of apertures, respectively, so that each pin extends over the outermost radial edge of the rotor in opposite axial directions to securements on said caliper, the pins movably received in said apertures to provide the movable support of the caliper by said torque member, and at least one of the pins supporting said one friction element so that braking torque is transmitted from the one pin to the respective flange, tie bar, arms and torque member.

4,530,424

AUTOMATIC BRAKING-GAP ADJUSTER SYSTEM FOR HYDRAULIC BRAKE

Genichiro Fukuzawa, and Isao Idesawa, both of Nagano, Japan, assignors to Nisshin Kogyo Kabushiki Kaisha, Japan

Filed Jul. 25, 1983, Ser. No. 517,203
Claims priority, application Japan, Sep. 30, 1982, 57-148121[U]; Sep. 30, 1982, 57-148122[U]
Int. Cl.³ F16D 65/56
U.S. Cl. 188—196 D **1 Claim**



1. An automatic braking-gap adjuster system for hydraulic brakes of the type comprising a cylinder and a piston slidingly disposed therein to define a hydraulic chamber, said system comprising:

(A) said piston having a reduced diameter portion at one end thereof and a collar at the end of said reduced diameter portion, said collar having a plurality of communicating openings therein;

(B) an adjusting nut having a flat base portion with a plurality of peripheral notches thereon corresponding to said openings, and an internally threaded shank;

(C) an adjusting bolt threadedly engaging the nut, said adjusting bolt having a tapered head forming a clutch section;

(D) a spring retainer having a spring seat and a plurality of legs extending therefrom, said legs extending through said notches and fixed to said piston through said openings, whereby said adjusting nut is restrained from turning;

(E) a spring arranged in a contracted state between said spring seat and said adjusting nut for biasing said adjusting nut toward said piston; and

(F) said chamber having a reduced diameter portion terminating in a conical face at the end opposite said piston, said conical face serving as a clutch face against which said clutch section of said bolt bears.

4,530,425

SHOCK ABSORBER

Jacques Veaux, Chatillon, and Andre Turiot, Morsang-sur-Orge, both of France, assignors to Messier-Hispano-Bugatti (S.A.), Montrouge, France

Filed May 26, 1983, Ser. No. 498,486
Claims priority, application France, Jun. 3, 1982, 82 09644
Int. Cl.³ F16F 9/44
U.S. Cl. 188—299 **20 Claims**

1. A shock absorber comprising:

a cylinder;

a rod slidably mounted in said cylinder;

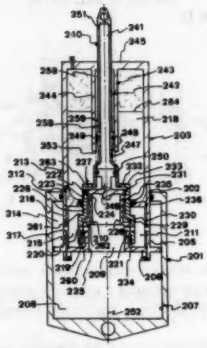
piston means fixed to said rod and slidable inside said cylinder, and defining, in conjunction with said cylinder, at least two chambers of volume which is variable as a function of the displacement of the rod in the cylinder, said piston means including a first wall portion disposed between said chambers, said first wall portion being in the shape of a right cylinder;

at least one first communication orifice in said first wall portion to enable a fluid to pass from one chamber to the other;

at least one auxiliary chamber having at least a second wall portion which is common to at least one of said two chambers;

an opening in said second wall portion;

a shutter closing said opening and moving relative to said opening while keeping it constantly closed, said opening being sealed by means including two spaced seals, said seals being so shaped that their respective contacting curves providing sealing are situated on a common right cylindrical surface;



a moving valve member suitable for moving over said first wall portion in friction to close said at least one communication orifice by an amount determined as a function of its displacement;

link means connecting said shutter to said valve member in such a manner that displacement of the shutter causes corresponding displacement of the valve member; and

means for controlling the displacement of said shutter.

4,530,426

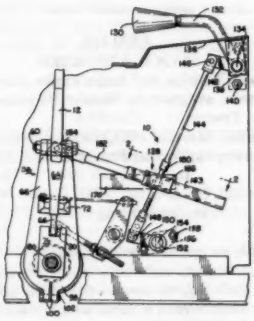
PARK LOCK AND TRANSMISSION INTERLOCK

Richard H. Mylander, Glen Ellyn, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed Dec. 6, 1982, Ser. No. 446,919

Int. Cl.³ B60K *41/26*

U.S. Cl. 192—4 A **6 Claims**



1. In a motor vehicle cab a park lock and transmission interlock assembly mounted on a vehicle console and comprising:

a handle mechanism pivotally secured to said vehicle cab console and connected with a lock rod;

said lock rod having its first end connected to said handle mechanism and its second end pivotally attached to said vehicle cab console;

an interlock rod supported by and moveable through a mount means and pivotally secured to a vehicle transmission shift lever for conjoint movement therewith;

said vehicle shift lever selectively engaging gears in said transmission;

said interlock rod having a slot with an enlarged aperture disposed at a predetermined location within said slot;

said mount means having an opening alignable with said enlarged aperture;

said lock rod projecting through said slot and said opening and moveable essentially transversely to said interlock rod;

said interlock rod moving across said lock rod within said slot parameters during all transmission shift lever engagements;

an interlock stop rigidly secured to said lock rod and nonrotatably slideable into said aligned aperture and opening only when said transmission shift lever being placed in a neutral position;

said stop being positioned within said mount means and said aperture for blocking displacement of said interlock rod and said shift lever.

4,530,427

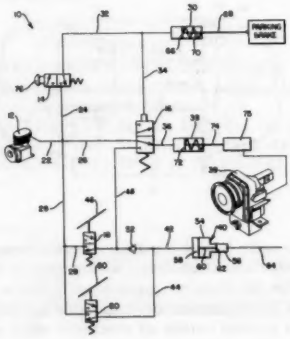
PARKING BRAKE DECLUTCHING SYSTEM

James C. Skeel, West Terre Haute, Ind., assignor to J. I. Case Company, Racine, Wis.

Filed Dec. 9, 1982, Ser. No. 448,118

Int. Cl.³ B60K *41/24*

U.S. Cl. 192—4 A **2 Claims**



1. A parking brake declutching system for neutralizing a transmission for a machine when a parking brake for the machine is engaged, said parking brake declutching system including means for discharging fluid under pressure to a parking brake valve, a declutch valve, and a service brake valve, said parking brake valve connected to a parking brake actuator which is spring applied for engaging said parking brake and fluid released for disengaging said parking brake, said declutch valve connected to said parking brake valve, said parking brake actuator, and to a clutch cut-out actuator which is operable to disengage said transmission, and said service brake valve connected to said declutch valve;

said parking brake valve being closed for venting fluid from said parking brake actuator thereby enabling said parking brake actuator to engage said parking brake and said declutch valve being positioned in a first position when said parking brake valve is closed to direct fluid under pressure to said clutch cut-out actuator for disengaging said transmission; and

said parking brake valve being opened for directing fluid under pressure to said parking brake actuator thereby enabling said parking brake actuator to disengage said parking brake and said declutch valve being positioned in

a second position in response to said parking brake valve being opened for exhausting fluid from said clutch cut-out actuator to said service brake valve thereby permitting said transmission to be re-engaged; and

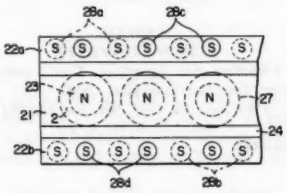
wherein said service brake valve connected to a service brake actuator and said service brake valve being operable to direct fluid under pressure to said service brake actuator and to said clutch cut-out actuator for disengaging said transmission when said declutch valve is in its second position.

4,530,428

APPARATUS FOR TRANSPORTING MATERIALS TO BE TRANSFERRED AND METHOD OF CONTROLLING EXCITING CURRENT THEREFOR

Katsutoshi Sato; Susumu Itoh, and Masaru Aoshima, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 7, 1983, Ser. No. 511,480
Claims priority, application Japan, Jul. 9, 1982, 57-118369
Int. Cl.³ B65B *11/20*
U.S. Cl. 193—40 **9 Claims**



1. In an apparatus for transporting a material to be transported, said apparatus comprising a plurality of rails slantingly arranged from a feed-in end to a feed-out end of said apparatus so that said material is transported by rolling down on said rails from said feed-in end to said feed-out end, said apparatus further comprising a plurality of electromagnets arranged along said rails, a method of controlling the excitation current for said electromagnets comprising the steps of:

dividing said plurality of electromagnets in order from said feed-in end to said feed-out end into a plurality of sets such that each of said sets consists of said electromagnets N in number;

dividing said plurality of electromagnets into N groups from a first group consisting of a first one of said N electromagnets constituting each of said plurality of sets to an N-th group consisting of an N-th one of said N electromagnets constituting each of said plurality of sets; and

successively performing the excitation for said plurality of electromagnets from said first group to said N-th group in order group by group, said successive excitation being repeated.

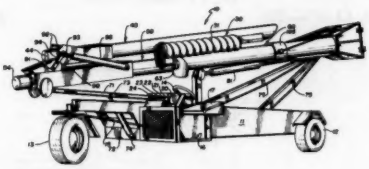
7. A transporting apparatus provided with a plurality of skid rails slantingly arranged from a feed-in end to a feed-out end of said apparatus so as to transport a material by causing said material to roll down on said skid rails from said feed-in to said feed-out end, said apparatus comprising a plurality of electromagnets arranged along said skid rails from said feed-in end to said feed-out end, each of said electromagnets including an inner pole having an upper end portion which faces the material when the material rolls on said skid rails and a lower end portion which is connected to a common base, an exciting coil wound on said inner pole, and a pair of outer poles respectively disposed below two associated skid rails, each of said outer poles having an upper end portion connected to one of said associated skid rails and a lower end portion connected to said common base, the upper end portions of said inner poles of said plurality of electromagnets being magnetically separated from each other.

4,530,429

SELF-PROPELLED, FOLDABLE GRAIN CONVEYOR

Vernon G. Erickson, DeLamere, N. Dak. 58022

Filed Sep. 13, 1982, Ser. No. 417,541
Int. Cl.³ B65G *15/26*
U.S. Cl. 198—313 **4 Claims**



1. Wheel-mounted, foldable grain conveying apparatus comprising:

a. a frame in the form of an isosceles triangle disposed substantially in a horizontal plane, mounted on wheels disposed at the respective corners of said frame for rotation about a horizontal axis perpendicular to the altitude of said triangle;

b. means for driving and steering the wheel at the apex of the triangle;

c. an intermediate conveyor section having an intake end and a discharge end mounted on and above said frame;

d. means for mounting said intermediate conveyor section above said frame with its longitudinal axis in a vertical plane passing through the altitude of the triangle and with said intake end above the apex of the triangle, and independently selectively varying the elevation of said intake end and said discharge end;

e. an intake conveyor section pivotally mounted to said intake end of said intermediate conveyor section for pivotal movement in a vertical plane passing through the longitudinal axis of said intermediate conveyor section about a horizontal axis above said intake of said intermediate conveyor section so that grain discharged from said intake conveyor section falls downwardly into the intake end of said intermediate conveyor section;

f. means for pivoting said intake conveyor section about said horizontal axis in said vertical plane from an extended position extending downwardly from said intake end of said intermediate conveyor section to a retracted position above and resting upon said intermediate conveyor section which comprises:

(1) a first spaced pair of circular gear teeth directed upwardly and disposed on a first common horizontal axis transverse to the longitudinal axis of said intermediate conveyor section at the intake end of and fixed to said intermediate conveyor section,

(2) a second spaced pair of circular gear teeth disposed on a second common horizontal axis transverse to the longitudinal axis of said intake conveyor section at the discharge end of and fixed to said intake conveyor section in respective engagement with said first spaced pair of circular gear teeth,

(3) means for maintaining said first and second pair of spaced gear teeth in respective engagement, and

(4) a spaced pair of double-acting hydraulic cylinders fixed to and extending respectively from said intermediate conveyor section to said second spaced pair of circular gear teeth; and

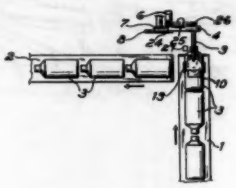
g. a discharge conveyor section pivotally mounted to said discharge end of said intermediate conveyor section.

4,530,430

DEVICE FOR TRANSFERRING SHAPED ARTICLES FROM A FIRST TO A SECOND BELT BY UNIFORM ORIENTATION ARRANGEMENT ON THE LATTER

Franco Peterlini, Reggio Emilia, Italy, assignor to M.O.S.S. S.r.l., Reggio Emilia, Italy

Filed Jun. 14, 1982, Ser. No. 387,781
Claims priority, application Italy, Jul. 24, 1981, 23143 A/81
Int. Cl.³ B65G 43/08
U.S. Cl. 198—395 13 Claims



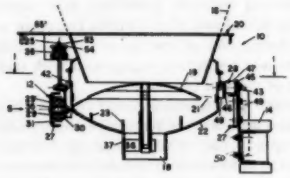
1. A device for transferring shaped articles from a first to a second belt, by arranging the same as uniformly oriented on the latter, comprising a lever element rotatably mounted on a pin integral with a rigid supporting bracket and connected to a control mechanism causing the oscillation thereof between two ends of stroke, at the first of which one free end of the lever element is adjacent to the first belt and at the second of which it is adjacent to the second belt, on said free end of the lever element there being mounted, through a pin about the axis of which it is freely rotatably, a support body carrying a gripping member for said articles and a device for controlling the rotation of said gripping member in either direction, means being also provided for controlling the attitude or position of said support body relative to said lever element, drive members for controlling the operation of said gripping member, and means for operating said rotation control device as a function of the orientation of the shaped articles incoming to the transfer device on said first belt, characterized in that said device for controlling the rotation of said gripping member comprises a cylinder, internally of which an intermediate vane is mounted and rotatable relative thereto between two walls of end of stroke, along with said cylinder and walls of end of stroke said intermediate vane defining two closed chambers, in which a hole opens for the admission therein and respectively discharge therefrom of a pressure fluid, one of said cylinder and intermediate vane being rotatably connected to the gripping member, and the other being blocked or clamped on said support body.

4,530,431

CENTER FLOW FEEDER AND VIBRATORY CONVEYOR

William V. Spurlin, Indiana, Pa., assignor to Syn-Energy, Inc., Indiana, Pa.

Filed Dec. 6, 1982, Ser. No. 447,295
Int. Cl.³ B65G 27/32
U.S. Cl. 198—534 17 Claims



1. A center flow feeder comprising in combination,

a frame,

a circular tray having a bottom, a side, a wall and a discharge opening in said bottom,

a hopper,

a vibrator,

said hopper having a central bottom outlet opening,

said tray being supported below said outlet opening,

means in said tray to move material to said discharge opening comprising an upwardly extending spiral wall supported therein and leading from the outer periphery of said tray toward the center thereof,

a circular head supported on said tray and spaced from said hopper outlet opening for providing a space between said hopper and said head for material to be moved from said outlet opening to said tray,

flexible means supporting said tray on said hopper,

flexible means supporting said tray on said frame,

vibration transmitting spring means connecting said tray and said frame,

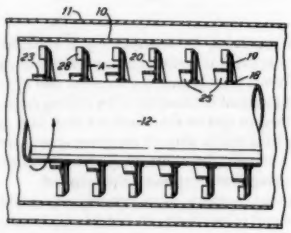
said vibrator being supported on said frame whereby said vibrator vibrates said frame moving said tray and said head relative to said hopper whereby material from said hopper and is agitated and moved into said tray and to said discharge opening.

4,530,432

SCREW CONVEYER

Robert F. Christian, San Francisco, Calif., assignor to Jude Engineering, Inc., San Francisco, Calif.

Filed Sep. 13, 1983, Ser. No. 531,701
Int. Cl.³ B65G 33/26
U.S. Cl. 198—662 4 Claims



1. A screw conveyer comprising a casing, a shaft mounted for rotation in the casing, a helical conveyer flite of constant external diameter mounted on and fixed to said shaft, and a helically wound member attached to said flite, said member being a separately formed flat ribbon attached at one edge to said flite of continuously decreasing diameter throughout its length in one axial direction so that the distance between the successive helices of said member from said shaft decreases, said member at each position extending from each helix of the conveyer flite axially partway towards the next helix of the conveyer flite and being spaced from the shaft and from the outer rim of said flite.

4,530,433

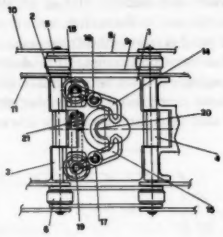
BOTTLE-HOLDER PINCERS FORMING A LINK IN A CONVEYOR CHAIN

Federico Cucchetto, S. Maria di Negrar, Italy, assignor to Enomec S.R.L., Verona, Italy

Filed May 9, 1983, Ser. No. 492,594
Claims priority, application Italy, May 18, 1982, 85567 A/82
Int. Cl.³ B65G 47/86
U.S. Cl. 198—695 4 Claims

1. BOTTLE-HOLDER PINCERS FORMING A LINK IN A CONVEYOR CHAIN characterized by the fact that on a plate (1), virtually rectangular in shape, equipped on one side with two lateral openings (2 and 3) and on the opposite side

with a centre opening (4), which fits into the lateral openings in the adjacent link, two pivotal levers (14 and 15) are mounted, which grip the neck of the bottle, acting in opposition to a half-collar (20) which follows the shape of the neck of



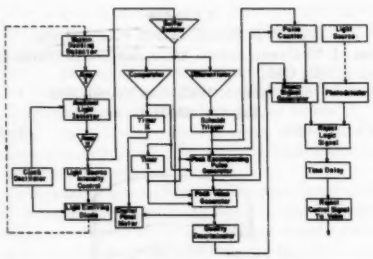
the bottle being processed, while on the opposite side of two guides (12 and 13) which, narrowing, act on the rollers (18 and 19) of the levers so as to open the pincers (14 and 15), acting in opposition to the return spring (21) so as to release the bottle from the pincers.

4,530,434

METHOD AND APPARATUS FOR THE INSPECTION AND SEPARATION OF SYMMETRICAL STABLE UNITS

Andrew Wowczuk, and William D. Pilesi, both of Monroeville, Pa., assignors to U.S. Plastic and Chemical Corp., Putnam, Conn.

Filed Aug. 9, 1982, Ser. No. 406,261
Int. Cl.³ B07C *5/342*
U.S. Cl. 209—588 **7 Claims**



1. Apparatus for the inspection of symmetrical stable units comprising:

(a) velocity and spacing control means for imparting a velocity to and a space between said units as they travel in a single line;

(b) first light emitting means operably mounted with respect to said control means, said light emitting means adapted to pass a light through said units;

(c) first detector means for detecting said light after it has passed through said units;

(d) first means for generating a wave form characteristic of the unit being inspected;

(e) second means for generating a pulse encompassing the wave form and comparing said pulse to pre-set values;

(f) third means for generating a signal which depicts the relative position of said units on said apparatus;

(g) said second means and third means generating a plurality of order signals; and

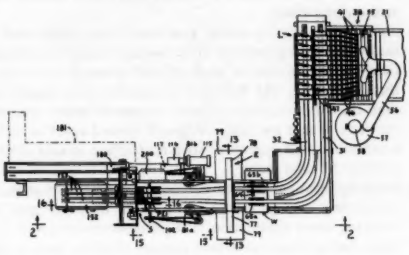
(h) means responsive to said order signals to selectively determine the further path of travel of the unit being inspected.

4,530,435

PACKAGING APPARATUS FOR STICK CONFECTIONS

Roger H. Stohlquist, Rockford, Ill., assignor to APV Anderson Bros. Inc., Rockford, Ill.

Filed Nov. 12, 1982, Ser. No. 441,087
Int. Cl.³ B07C *5/02, 5/16*
U.S. Cl. 209—592 **21 Claims**



1. A packaging apparatus for assembling wrapped stick confections from a multi-lane packaging machine into groups with the stick ends of the wrapped stick confections overlapping, comprising, endless type first and second conveyor means each having product pusher means at uniformly spaced locations therealong defining pockets between adjacent pushers for advancing stick confections crosswise of their length from a loading station sequentially past a weighing station and an ejecting station to a stacking station, the first and second conveyor means having relatively parallel inlet portions, means for feeding wrapped stick confections from the multi-lane wrapping machine into the pockets on the first and second endless conveyor means with the stick ends in juxtaposition, weigh scale means at the weighing station, the first and second conveyor means having relatively parallel intermediate portions extending past the weigh scale means with the product pushers on the intermediate portions of the first and second conveyor means arranged in transverse alignment to advance wrapped stick confections in opposed pairs to and away from the weigh scale means, ejector means at the ejecting station adapted when operated to eject wrapped stick confections from both the first and second conveyor means, means responsive to the weigh scale means and operative when the total weight of the wrapped stick confections advanced by a transversely aligned pair of product pushers to the weigh scale means is less than a predetermined value for operating ejector means to eject the stick confections advanced by that pair of transversely aligned pair of product pushers when they advance past the ejecting station, the first and second conveyor means having outlet end portions extending from the ejecting station to the stacking station with the product pushers arranged in transverse alignment to advance wrapped stick confections in opposed pairs and with their stick ends overlapping to the stacking station and group forming means at the stacking station for assembling opposed pairs of wrapped stick confections from the first and second conveyor means into groups comprising a plurality of pairs of wrapped stick confections.

4,530,436

SCREW CAP WITH GUARANTEE STRIP FOR CONTAINER

Walter Wiedmer, Am Linthli 2, Näfels, Switzerland

Continuation of Ser. No. 442,838, Nov. 18, 1982, abandoned. This application Nov. 5, 1984, Ser. No. 668,189
Claims priority, application Switzerland, Dec. 11, 1981, 7940/81-7
Int. Cl.³ B65D *41/24*
U.S. Cl. 215—246 **2 Claims**

1. A screw cap for containers, particularly for beverage bottles, comprising:

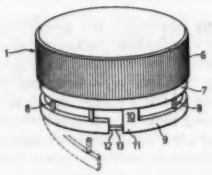
a closure member having a lower edge;

a closing band having a lower edge and an upper edge which is connected to said closure member lower edge, said closing band having a thickness which is less than the thickness of said closure member;

a plurality of webs connected to said closing band lower edge, said webs being fracturable upon removal of said closure member from a container and being thinner than said closing band;

a continuous, uninterrupted guarantee strip connected to said webs, said guarantee strip having a thickness greater than the thicknesses of each of said webs to be stronger than said webs and having a circumferential length less than the circumference of said closure member whereby the ends of said guarantee strip are spaced apart to define a gap when said guarantee strip is attached to said closure member by said webs;

a breaking element means extending across said gap for connecting said guarantee strip ends together and for breaking upon application of a predetermined amount of force during removal of said closure member from a container to release said guarantee strip ends, said guarantee strip, said webs, and said closing band being heat shrinkable relative to said closure member to bear against the container said guarantee strip being inwardly offset from said closure member and at least a portion of said closing band and said webs, whereby upon breaking of said breaking element means said guarantee strip will tend to be forced outwardly away from the container adjacent to said gap due to release of forces within said heat shrinkable guarantee strip after release of the ends of said guarantee strip by the breaking of said breaking element means; and



a connecting piece means for connecting one end of said guarantee strip to said closing band lower edge, said connecting piece means being stronger than said webs and said breaking piece means for ensuring breaking of said breaking piece means and the webs adjacent to said gap upon application of the predetermined amount of force for causing the other end of said guarantee strip to move outwardly away from the container after said breaking piece means is broken.

4,530,437

TAMPERPROOF PACKAGE

Thomas W. Gray, Toledo, and Ralph H. Whitney, Whitehouse, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 373,911, May 3, 1982, abandoned. This application May 4, 1984, Ser. No. 606,861

Int. Cl.[3] B65D *41/34*

U.S. Cl. 215—252 **8 Claims**

1. A tamperproof package comprising

a container having a neck and a radial flange beneath the neck,

and a plastic closure,

said closure having a top wall and a peripheral skirt,

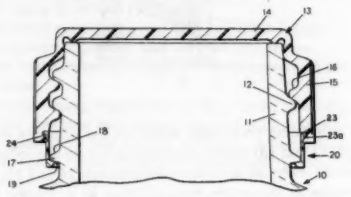
interengaging means between the closure and the neck,

a separate plastic pilfer band,

axially engageable and disengageable interengaging portions between said band and said skirt operable upon relative axial movement to engage and disengage the skirt and band,

said band having radially inwardly extending portions adapted to extend below the flange of the container such that when the closure is applied to the container, the band is flexed over the annular flange of the container, and when the closure is thereafter removed from the container, the band is prevented from removal from the container and is thereby disengaged from the closure,

said interengaging portions between said skirt of said closure and said band comprising an annular notch on the inner surface of said skirt facing radially inwardly,



said band having an annular band on the outer surface engaging said notch,

the outer diameter of the bead being greater than the inner diameter of the portion of the wall having the notch therein and being such that the band must be compressed radially inwardly to apply the band to the closure so that the band has an interference fit with the skirt of the closure in order that in the unrestrained position of said band, after the band has been disengaged from the closure, it cannot re-engage with the skirt upon re-engagement of the closure with the container.

4,530,438

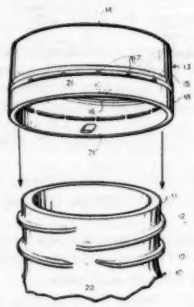
TAMPER INDICATING PACKAGES

Thomas M. McDevitt, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed May 4, 1985, Ser. No. 607,053

Int. Cl.[3] B65D *41/34*

U.S. Cl. 215—252 **10 Claims**



1. A tamper indicating package comprising

a container having a neck with external threads formed thereon,

a plastic closure comprising a top panel and an integral depending annular skirt,

said skirt having integral internal threads thereon complementary to the threads on the neck of the container,

said container having an annular bead positioned axially below the threads,

said skirt having a ring at the lower end thereof connected to

the remainder of the skirt along a weakened line below the threads when the closure is on the container,

said bead having a notch in the periphery thereof,

said ring having a radially inwardly extending lug on the inside surface thereof constructed and arranged such that when the closure is fully threaded on the container, the lug falls into the notch and when the closure is rotated to unthread the closure, the lug engages the bead and passes under the bead and is cammed downwardly under the bead and at least a portion of the band is severed from the remainder of the closure.

4,530,439

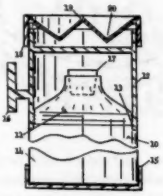
THERMOS BOTTLE CAP DOUBLES AS A CUP

Reuben Finnell, 898 Brittain Rd., Akron, Ohio 44305

Filed Sep. 24, 1984, Ser. No. 653,895

Int. Cl.³ B65D *41/26*

U.S. Cl. 220—90.4 **4 Claims**



1. In a thermos bottle the improvements comprising:

a cap recessed deep enough to form a fluid cavity therein terminates with an end wall at a first blind end thereof while a second opposite end is open comprising a mouth which is threaded and adaptable of closing a top end of said thermos bottle,

a lid with dual liquid withdrawal openings spaced in opposite directions adjacent perimeter thereof and adaptable of closing said open mouth end of said cap for sealing control against liquid spillage enroute while allowing liquid dispensing therefrom via a first opening while a second opening serves as a vent,

said cap when removed from said thermos bottle doubles as a cup adaptable of receiving liquid in said fluid cavity via said open mouth thereof and of being closed by said lid so as to allow subsequent liquid sipping therefrom via either of said lid openings, a retainer ring of a size that permits storage of said cup when not used to prevent cup slippage with liquid slashing including means for securing said retainer ring to a flat surface.

4,530,440

CONTAINER LID WITH TEMPERATURE RESPONSIVE VENTS

Christopher Leong, Cumberland Park, Australia, assignor to Buxdel Pty. Limited, Adelaide, Australia

PCT No. PCT/AU82/00121, § 371 Date Apr. 1, 1983, § 102(e) Date Apr. 1, 1983, PCT Pub. No. WO83/00476, PCT Pub. Date Feb. 17, 1983

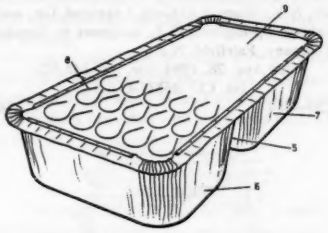
PCT Filed Aug. 3, 1982, Ser. No. 482,339

Claims priority, application Australia, Aug. 4, 1981, PF0039

Int. Cl.³ B65D *55/00*

U.S. Cl. 220—201 **8 Claims**

1. A disposable lid for use with a disposable food receptacle of the type useful for the storage and heating of food, the lid having at least one vent means which opens by deforming upon the application of heat, the lid being multi-layered with at



least two of the layers having different co-efficients of thermal expansion.

4,530,441

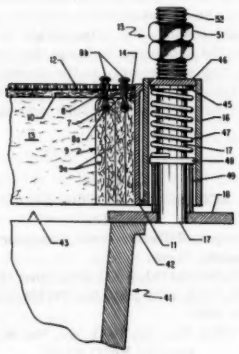
READILY REPAIRABLE AND LIGHTWEIGHT INSULATING COVER FOR A HEATED METAL CONTAINER

Thomas M. Miller, North Olmsted, and Raymond J. Schraff, Cleveland, both of Ohio, assignors to ELTECH Systems Corporation, Boca Raton, Fla.

Filed Oct. 2, 1984, Ser. No. 656,826

Int. Cl.³ B65D *6/10*

U.S. Cl. 220—215 **28 Claims**



1. A lightweight insulation cover adapted for retaining heat in a heated metal container, which cover comprises:

a frame member sized at least substantially to the upper aperture of a heated metal container;

frame member guide means having depending elements projecting downwardly away from said frame member for straddling engagement with the outer top of said container;

frame member impact assemblies each containing a depending leg, resiliently mounted within said assembly and terminating downwardly in a foot aligned for resting engagement upon said container;

ceramic fiber insulation filler in form-stable condition within said frame member;

a foraminous covering over said insulation filler;

securing means connecting said insulation filler to said foraminous covering means; and

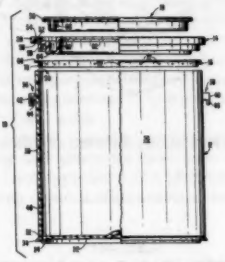
stiffening members over said foraminous cover means and affixed to said frame member.

4,530,442

PLASTIC CONTAINER AND SEALING RING ASSEMBLY THEREFOR

William M. Vogel, Jr., Mendham, N.J.; Rolf E. Weingardt, Scarsdale, N.Y.; Waco J. O'Guin, Lakeland, Ga., and Joseph S. Littenberg, Springfield, N.J., assignors to Standard Container Company, Fairfield, N.J.

Filed Aug. 28, 1984, Ser. No. 645,021
Int. Cl.³ B65D *43/06*
U.S. Cl. 220—354 **24 Claims**



1. A composite sealing ring subassembly for a plastic container adapted to be induction welded to said sealing ring subassembly, comprising a sealing ring made from a plastic material, said sealing ring having a central opening sized and shaped so as receive a closure for the container and a circular groove sized and shaped so as to receive a rim of the container, and an insert made from an electrically conductive material, said insert being fixedly positioned in said groove in said sealing ring so as to be in juxtaposition with the rim of the container when said sealing ring subassembly is applied to the container, whereby said insert facilitates the induction welding of said sealing ring subassembly to the container by focusing the heat generated during the induction welding operation along the joint between the container and said sealing ring subassembly.

4,530,443

UNITARY ACCESS PANEL FOR AIRCRAFT FUEL TANKS

Friedrich J. Gorges, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

PCT No. PCT/US83/01761, § 371 Date Nov. 10, 1983, § 102(e) Date Nov. 10, 1983, PCT Pub. No. WO85/02159, PCT Pub. Date May 23, 1985
PCT Filed Nov. 10, 1983, Ser. No. 567,843
Int. Cl.³ B65D *45/00*
U.S. Cl. 220—327 **22 Claims**

1. A unitary structure access panel for a fuel tank, comprising:

a molded reinforced hard plastic panel base for fitting into an opening in a tank;

said panel base having an external first face for fitting into the tank and having peripheral side portions extending from the first face;

an external second face, opposite said first face and joining said peripheral side portions, for facing outwardly along the tank wall,

said second face being formed of lightweight electrically conductive material;

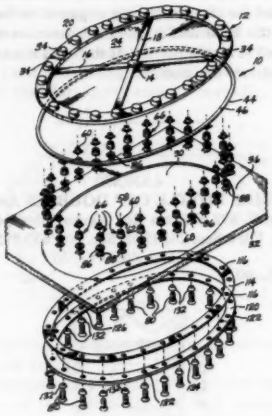
a peripheral hard plastic portion on said base extending around said first face for extending into the tank and overlapping an inner marginal tank surface around and along the tank opening;

a high strength-to-weight core in said base inwardly of said peripheral portion and extending between said faces and said peripheral side portions;

a continuous groove in said peripheral portion for containing a seal for forming a seal between the peripheral portion and the marginal surface of the tank;

peripherally spaced inserts in said peripheral portion;

means in said inserts to retain fastener nuts therein and against rotation and adjustably to receive threaded ends of fasteners; and



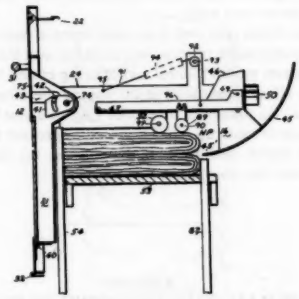
a peripherally outer surface of said peripheral portion extending around and along said groove, said outer surface facing in the same direction as the seal for making direct contact with said marginal surface along said seal.

4,530,444

SEPARATION DEVICE FOR SINGLE COPY NEWSPAPER VENDOR

Donald K. Christian, P.O. Box 5806, Spartanburg, S.C. 29304

Continuation-in-part of Ser. No. 286,336, Jul. 23, 1981, Pat. No. 4,418,836. This application Sep. 30, 1982, Ser. No. 430,472
Int. Cl.³ G07F *11/14*
U.S. Cl. 221—37 **4 Claims**



1. In a vending machine to dispense single copies of newspaper, magazine or the like comprising;

(a) a cabinet, said having a storage area associated therewith;

(b) a coin mechanism assembly mounted thereon, said mechanism having a coin receiving means therein and a release means to permit purchaser access to a chamber wherein is contained a single copy thereof;

(c) a hinged purchaser access door;

(d) a dispensing mechanism associated with said door in such manner that opening of said door will effect the separation of a single copy by inserting a portion of said dispensing

mechanism generally between the topmost and second-most copy thereinunder; said dispensing mechanism moving from the back generally toward the purchaser;

(e) an elevator so oriented as to continue presenting copies of the publicaiton to said dispensing mechanism;

an improvement comprising the dispensing mechanism including a cam roller, the cabinet including a ramp surface contacting the cam roller; the relationship between the cam roller and ramp surface being such that as the access door is opened and the cam roller moves along the ramp surface a portion of the dispensing mechanism first slides between the topmost and second most copies and then raises the top most copy upwardly above a vertical extending restraining surface whereby the top most copy is allowed to fall to a position of customer access as the access door is moved to an open position.

4,530,445

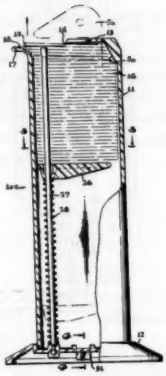
PAPER CLIP HOLDER

David E. Decker, 9785 Samoa Ave., Tujunga, Calif. 91042

Filed Sep. 28, 1982, Ser. No. 425,228

Int. Cl.³ B65D *83/08*

U.S. Cl. 221—198 **1 Claim**



1. A paper clip holder for storaging a plurality of paper clips comprising:

an elongated housing having opposite open ends;

stop means partially closing a selected end of said housing;

a stack of paper clips arranged in an aligned stack within said housing;

spring biasing means forcibly urging said stack against said stop means presenting a portion of the uppermost clip in said stack through said housing open at said selected end preparatory to be dispensed;

said biasing means includes a base closing the end of said housing opposite to its selected end;

a rod upwardly projecting from said base through said aligned stack of clips terminating immediately at said opening adjacent said stop means below said uppermost clip of said stack;

a foot slidably mounted on said rod and cantilevered outwardly from said rod within said housing;

expansion spring means operable between said base and said foot to urge said stack against said stop means;

snap-lock means cooperatively carried between said housing and said base for detachably connecting said base to said housing so as to support said housing in an upright vertical position;

a removable insert holding said stack of paper clips and having an enlarged end projecting out of said opening at said selected housing end;

said insert having an enlarged portion at one end and a pair of integrally biased prongs on its end;

each prong of the pair terminating in outwardly extending lobes whereby said stack of clips are disposed along the length of said insert between said enlarged portion and said lobes;

said stop means including an open-ended slit for passing said insert therethrough leaving said stack of clips disposed in said housing;

said housing selected end provided with an outwardly projecting bill or beak on the end of said opening opposite to its end partially closed by said stop means; and

said bill or beak provided with a recessed lead-in for receiving one end of said uppermost clip.

4,530,446

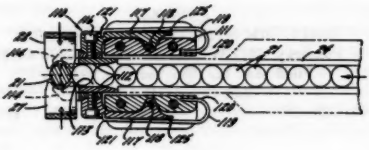
MACHINE FOR HANDLING PARTS

Paul H. Dixon, Belvidere, Ill., assignor to Dixon Automatic Tool, Inc., Rockford, Ill.

Division of Ser. No. 305,912, Sep. 28, 1981,. This application Jan. 20, 1984, Ser. No. 572,405

Int. Cl.³ B65H *3/34*

U.S. Cl. 221—223 **3 Claims**



1. An escapement for holding parts in a row in a track and for permitting successive leading parts to be pulled out of the forward end of the track by a pair of opposing jaws, said escapement comprising a support, a pair of opposing fingers mounted on said support to move between open and closed positions, said fingers retaining the leading part in the forward end of the track when said fingers are in said closed positions and releasing such part when said fingers are in said open positions, means biasing said fingers to said closed positions, and a slot formed in each finger, each slot extending between the inboard and outboard sides of the finger and opening out of the forward end thereof, said slots permitting said jaws to move laterally into and through the fingers to grip the leading part and permitting the jaws to move forwardly out of the fingers to pull the part out of the track, the part forcing said fingers to said open positions as an incident to being pulled out of the track by the jaws.

4,530,447

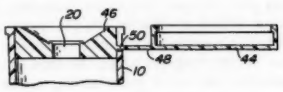
DISPENSER

Donald J. Greenspan, 235 Pavilion Ave., Riverside, N.J. 08075

Continuation of Ser. No. 330,940, Dec. 15, 1981, abandoned, which is a continuation-in-part of Ser. No. 228,636, Jan. 26, 1981, abandoned. This application Jul. 17, 1984, Ser. No. 631,511

Int. Cl.³ G01F *11/26*

U.S. Cl. 221—288 **27 Claims**



1. A dispenser apparatus for dispensing at least one item at a time which comprises:

(a) a container having walls and an opening at least at one end thereof through which items can be dispensed with an

openable cover overlying said opening, said container holding items for dispensing; and

(b) a dispensing member positioned between the container opening and the items in the container, the member having at least one generally centrally positioned aperture extending therethrough, said aperture being at least slightly larger than the diameter of the largest item to be dispensed, said cover being directly connected to said dispensing member by a flexible hinge, said hinge passing through an opening in the wall of the container, said member having an inner surface juxtaposed to said held items and an outer surface juxtaposed to said container opening, said inner surface being generally flat and perpendicular to the container walls said outer surface sloping downwardly toward said aperture to form at least a partial frusto-conical concave section to support at least one dispensed item which passes through said aperture when said container is turned upside down and then turned at least partially rightside up with said cover over said opening, whereby said dispensed item is available for access on said outer surface upon the disengagement of said cover from said container.

4,530,448

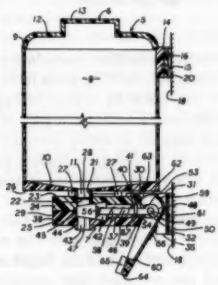
WALL MOUNTED LIQUID DISPENSER

John F. Ponyicky, 5472 W. 84th St., Parma, Ohio 44129

Filed May 11, 1983, Ser. No. 493,625

Int. Cl.³ B67D 3/00

U.S. Cl. 222—181 **15 Claims**



1. A dispenser, comprising:

(a) a vertically elongated tank when the dispenser is mounted for operation, the tank having an inlet opening through which flowable material is placed in the tank and an outlet opening through which material, in the tank, flows from the tank, by gravity; and

(b) a valve assembly for controlling the flow of material from the tank, including:

(I) an enclosed cylindrical fluid passageway which is vertically aligned with the outlet opening so that material will flow, by gravity, from the outlet opening through the passageway when the passageway is at least partially open and unblocked;

(II) a valve reciprocable along a horizontal axis into and out of blocking relationship with the passageway between opposing ends thereof, the valve including a horizontal valve stem which is attached to the valve and extends therefrom in a rearwardly direction from the passageway and front of the dispenser when the dispenser is mounted for operation, the valve stem having a free end which extends exteriorly of the valve assembly;

(III) means for spring-loading the valve in blocking relationship with the passageway;

(IV) a lever pivotally mounted on the free end of the valve stem for rotation in a vertical plane, the lever having a free end which extends below the passageway in converging relationship with the longitudinal axis of the passageway; and

(V) means carried by the lever above the valve stem for coaction with the valve assembly adjacent the free end of the stem, for causing the valve to move in a direction away from the passageway to unblock the passageway when the free end of the lever is rotated in a direction away from the passageway.

4,530,449

LIQUID SPRAYING DEVICE

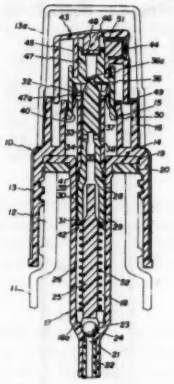
Takamitsu Nozawa, Tokyo; Takao Kishi, Funabashi, and Shigeo Iizuka, Tokyo, all of Japan, assignors to Yoshino Kogyosho Co. Ltd., Tokyo, Japan

Filed Feb. 5, 1980, Ser. No. 118,739

Claims priority, application Japan, Mar. 19, 1979, 54-32061

Int. Cl.³ B05B 9/043

U.S. Cl. 222—189 **2 Claims**



1. A liquid spraying device, comprising:

a container having a neck;

an axially perforated cap engaged with the neck of said container;

an actuator having a fluid passage, elevationally movably associated with the upper portion of said cap;

nozzle means formed on a face of said actuator;

first pressure chamber means having a spring seat, extending downwards from the interior of said cap, having an upper vent hole for preventing vacuum formation in said first pressure chamber means, a lower vent hole for priming said first chamber, a recess formed on the inside peripheral wall of said first pressure chamber means and an elevational, axially-extending rib formed in said recess and having a height so as to extend to the level of the inner wall of said first pressure chamber means, said rib defining a straight, uninterrupted, continuous surface across said recess with the inside peripheral wall of said first pressure chamber means;

second pressure chamber means formed in axial alignment with said first pressure chamber means, within said actuator, having a larger diameter than said first pressure chamber means;

a sliding tubular member telescopically inserted into said first pressure chamber means, having a first piston member formed at the lower portion of said tubular member and a second piston member having an upper chamber formed at the upper portion of said tubular member and telescopically inserted into said second pressure chamber means, said first piston member having upper and lower sealing skirts formed to elastically and hermetically contact the inside wall of said first pressure chamber

means, said rib providing a gap between the lower sealing skirt and the first pressure chamber means to introduce air within said first pressure chamber means into said container when said sliding tubular member is moved to its lowermost position, said first piston member comprising outer and inner cylindrical members, a stem being slidably disposed in said first pressure chamber means, said inner cylindrical member comprising a hollow lower portion for inhibiting movement of the stem slidably disposed within said first pressure chamber means, an upper solid portion with a conical valve body slidably disposed within the outer cylindrical member, said upper solid portion comprising a plurality of axial passage grooves on the outer face of the upper solid portion and holes radially extending from said grooves providing fluid communication from the lower hollow portion to the upper chamber of said second piston, said upper and lower sealing skirts being formed at the lowermost edges of said inner and outer cylindrical members;

spring means located between the spring seat of said first pressure chamber means and the lower end of said first piston member for upwardly urging said sliding tubular member and said actuator;

an openable valve member disposed at the bottom of said first pressure chamber means;

a tubular cylinder extending downwards from the interior of said actuator, having a cylindrical projection extending downwards from the interior of said tubular cylinder; and

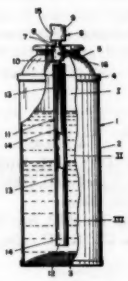
a reduced-diameter cylinder formed at the upper end of said second pressure chamber means and inserted into the tubular cylinder of said actuator.

4,530,450

AEROSOL DISPENSING SYSTEM

Arun Nandagiri, Redding, Calif., assignor to American Cyanamid Co., Stamford, Conn.

Filed Feb. 7, 1983, Ser. No. 464,452
Int. Cl.³ B65D *83/00*
U.S. Cl. 222—402.1 **7 Claims**



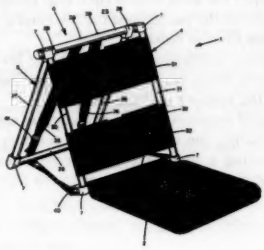
1. Valve and diptube means for a pressurized aerosol container, containing two immiscible liquid phases and a vapor phase therein; said valve and diptube means adapted to simultaneously draw off both liquid phases to said valve means; said valve and diptube means comprising a hollow plastic diptube extending to a point near the bottom of said container and open at the lower end thereof, and being preferentially permeable to the upper of said liquid phases and preferentially impermeable to said vapor phase and said lower liquid phase, said diptube having increasing permeability to said upper liquid phase towards its lower end.

4,530,451

COMBINATION BACK PACK/BEACH CHAIR

James Hamilton, 189 Upland Rd., Cambridge, Mass. 02140

Filed Nov. 28, 1983, Ser. No. 555,652
Int. Cl.³ A45F *4/02*
U.S. Cl. 224—155 **4 Claims**



1. A multiple function assembly for use as a seat or back pack comprising:

a frame assembly having a front section and a back section,

means for hinging said front and back sections together for articulating relative movement in an arc of substantially 45 degrees between a storage position and a use position,

a seat pad shaped and sized for storage in flat parallel relation to said front and back sections when said front and back sections are positioned in substantially parallel relation,

said front and back sections being positioned parallel to one another with said seat pad therebetween when said assembly is in said storage position,

means for securing said seat pad to said front section and permitting movement of said seat pad between said storage position and said use position wherein said seat pad extends at an obtuse angle with respect to said front section,

a storage bag having at least one wall shaped and sized to substantially conform with said back section, and

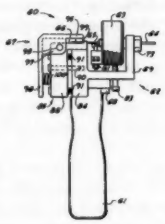
means for detachably inter-engaging said storage bag with its one wall in facing engagement with said back section.

4,530,452

APPARATUS FOR CLEAVING AN OPTICAL FIBER

Marik Balyasny, Van Nuys, and William F. Lovell, Los Angeles, both of Calif., assignors to Automation Industries, Inc., Greenwich, Conn.

Continuation of Ser. No. 370,039, Apr. 20, 1982, abandoned. This application Aug. 29, 1984, Ser. No. 645,295
Int. Cl.³ C03B *37/16*
U.S. Cl. 225—96 **5 Claims**



1. Apparatus for cleaving an optical fiber comprising:

shaft means having an axially extending opening therethrough for receiving a fiber therein;

a transfer block having a fiber support surface thereon;

first spring means resiliently urging the transfer block away from the shaft means;

lever means pivotally mounted to said transfer block for selectively moving a fiber holding pad toward and away from the transfer block support surface while simultaneously moving the transfer block respectively away from and toward the shaft means such that release of the lever means moves the pad against the fiber and at the same time places the fiber in tension;

second spring means interconnecting the lever means and the transfer block resiliently urging the fiber holding pad toward the support surface; and

sharp-pointed means rotatably mounted on said shaft means for contacting the circumferential periphery of the fiber and effecting a single score line completely around the fiber that is precisely 90 degrees to the fiber longitudinal axis.

4,530,453

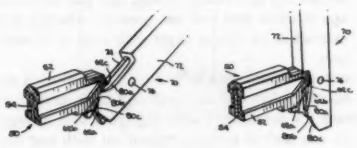
SURGICAL FASTENER APPLYING APPARATUS

David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Oct. 4, 1983, Ser. No. 538,830

Int. Cl.³ A61B *17/04*

U.S. Cl. 227—19 **13 Claims**



1. Apparatus for applying surgical fasteners to body tissue comprising:

an anvil assembly;

a fastener holding assembly movably mounted relative to the anvil assembly; and

actuator means for supporting the anvil assembly and for moving the fastener holding assembly toward the anvil assembly to clamp the tissue to be fastened between the anvil assembly and the fastener holding assembly, the actuator means including (1) a lever member pivotable by the operator of the apparatus to produce the mechanical work necessary to cause the fastener holding assembly to move and clamp the tissue, the lever member having a cam surface which moves when the lever member is pivoted, and (2) a movable cam follower member having a cam follower surface in contact with the cam surface for transmitting the mechanical work of the lever member from the cam surface to the fastener holding assembly to cause the fastener holding assembly to move and clamp the tissue, the cam surface and the cam follower surface including cooperating segments which comprise detent means for releasably holding the fastener holding assembly at a predetermined position intermediate the position in which the actuator means begins to move the fastener holding assembly toward the anvil assembly and the position in which the tissue is clamped.

4,530,454

DEVICE FOR DRIVING NAILS AND SIMILAR FASTENING ELEMENTS

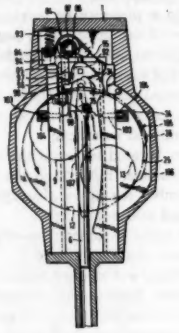
Peter Gloor, Zollikerberg, Switzerland; Hans Gschwend, Vaduz, Liechtenstein; Fritz Mark, Mäder, Austria, and Lukas Matt, Mauren, Liechtenstein, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Oct. 11, 1983, Ser. No. 540,816

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1982, 3237616

Int. Cl.³ B25C *1/06*

U.S. Cl. 227—129 **16 Claims**



1. A device for driving nails and similar fastening elements includes a driver rod for driving in the nails and a driving unit including a driving element moving through a rotational cycle for driving said driver rod, said driving element is connectable with said driver rod for transmitting a substantially rectilinear motion thereto, wherein the improvement comprises that said driving element includes a carrier engageable with said driver rod with said carrier moving along an elongated path of movement generally in the direction of the rectilinear movement of the driver rod, said driver rod includes a coupling device for connecting said carrier to said driver rod in the rotational cycle of said driving element, said driving element includes a planet pinion mounted on and rotated by said driving element, said carrier is secured to said pinion, a hollow gear wheel encircles said planet pinion and is coaxial with said driving element, said planet pinion rolls in meshed engagement with said hollow gear wheel, and the pitch diameter of said planet pinion corresponds to half of the pitch diameter of said hollow gear wheel.

4,530,455

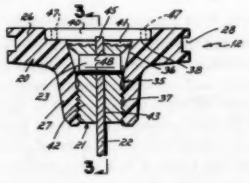
PISTON AND DRIVER

George F. Vornberger, Cincinnati, Ohio, assignor to Senco Products, Inc., Cincinnati, Ohio

Filed Aug. 11, 1983, Ser. No. 522,645

Int. Cl.³ B25C *1/04, 7/00*

U.S. Cl. 227—130 **19 Claims**



1. A piston and fastener driver for use in fastener driving apparatus and comprising:

a piston body having a threaded bore and an outwardly tapering bore extending from said threaded bore;

a piston insert disposed in said threaded bore and said tapering bore and including a threaded male portion threaded into said threaded bore, and a frusto-conical portion having cooperating surfaces engaging said tapering bore;

a longitudinal slot in said insert through said threaded male portion and said frusto-conical portion; and,

a driver disposed in said slot, said insert frictionally engaging and holding said driver, with said driver extending from an end of said insert opposite said frusto-conical portion.

4,530,456

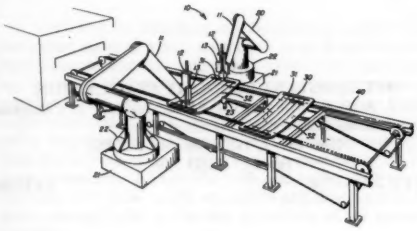
METHOD AND APPARATUS FOR SOLDERING BY MEANS OF AN INDUSTRIAL ROBOT

Donald P. Michelotti, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 4, 1983, Ser. No. 491,467

Int. Cl.³ B23K *31/02*; H01L *21/58*

U.S. Cl. 228—102 **16 Claims**



1. A method for soldering an item to a workpiece having electrically conductive and electrically non-conductive portions, with an industrial robot having a soldering head end effector, comprising the steps of:

positioning the workpiece within the working range of the robot;

activating a workpiece contacting conductivity sensor means associated with the soldering head end effector to contact the workpiece and to sense the presence of the electrically conductive portion of the workpiece;

controlling the robot to move the soldering head to a first soldering position in response to said sensor means; and

soldering the item to the workpiece electrically conductive portion.

4,530,457

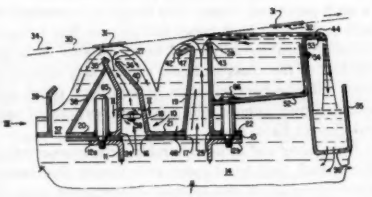
WAVE-SOLDERING OF PRINTED CIRCUIT BOARDS

William H. Down, Brossard, Canada, assignor to Electrovert Ltd., Canada

Filed Jan. 12, 1982, Ser. No. 338,952

Int. Cl.³ B23K *1/12*; H05K *3/34*

U.S. Cl. 228—180.2 **28 Claims**



1. Apparatus for applying solder to exposed metallic surfaces on one face of circuit boards or the like comprising means for conveying circuit boards along an upward sloping path, a reservoir adapted to contain molten solder, a first nozzle communicating with the reservoir and having a solder outlet positioned above the reservoir and having a circuit board entry side and a circuit board exit side, the first nozzle being formed to produce a jet-like solder wave which is upwardly projecting with an initial high pressure gradient for engagement with the lower faces of the circuit board as they pass along the path above the nozzle exit, a second nozzle communicating with the reservoir and having a solder outlet positioned above the reservoir and having a circuit board entry side and a circuit board exit side, the second nozzle being spaced from and positioned downstream of the first nozzle with respect to the direction of conveying of the circuit boards and being formed to produce a smooth laminar solder wave for engagement with the lower faces of the circuit boards as they pass along the path, and means for circulating solder through the nozzles.

4,530,458

SOLDERING APPARATUS

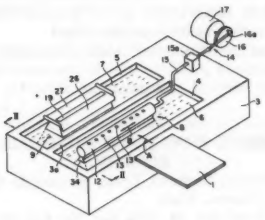
Kenshi Kondo, Tokyo, Japan, assignor to Nihon Den-Netsu Keiki Co., Ltd, Japan

Filed Dec. 16, 1983, Ser. No. 561,981

Claims priority, application Japan, Dec. 17, 1982, 57-220189; Dec. 17, 1982, 57-220190; Jan. 18, 1983, 58-5282; Feb. 22, 1983, 58-27077

Int. Cl.³ B23K *1/08, 3/06*

U.S. Cl. 228—180.1 **18 Claims**



1. In an apparatus for soldering printed circuit board moving along a predetermined transfer path, which comprises a vessel for containing a molten solder, an upwardly extending riser having its lower end in flow communication with the vessel, and feed means operable for supplying the molten solder within the vessel to overflow from the upper open end of the riser, with the underside surface of the printed circuit board being contacted with the overflowing molten solder, the improvement comprising: said riser being provided at its upper open end with a plurality of molten solder-overflowing ports arranged transversely to said transfer path so that the molten solder overflowing therefrom may form a transversely oriented standing wave having a plurality of protruded surfaces over respective overflowing ports, said overflowing ports being moveable such that said standing wave may progress in a direction transverse to said transfer path, whereby the underside surface of the printed circuit board is contacted with the progressive wave of molten solder overflowing from the moving overflowing ports.

4,530,459

FOLDING CARRIER CARTON INCLUDING SPLIT COVER CLOSURE, REMOVABLE TRAYS AND BLANKS FOR MAKING SAME

Raymond V. Maroszek, Neenah, Wis., assignor to James River - Norwalk, Inc., Norwalk, Conn.

Filed Sep. 16, 1983, Ser. No. 533,848

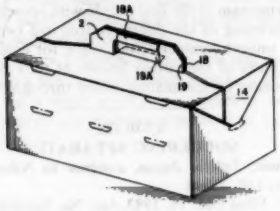
Int. Cl.³ B65D *5/35*

U.S. Cl. 229—23 R **8 Claims**

1. A folding carrier carton comprised of:

(a) a split cover closure having a pair of oppositely disposed end cover panels wherein at least one of said cover panels includes a substantially triangular shaped web flap, and

first and second oppositely disposed side cover panels wherein each of said side cover panels includes corresponding foldable handles adapted to interlock with each other in folded condition, and shoulder members adapted to overlap one another in folded condition wherein the shoulder members of the first side cover panel member are of a lesser dimension than the shoulder members of the second side cover panel;



(b) a substantially rectangular frame interconnected to said split cover closure wherein said frame includes a corresponding pair of oppositely disposed side panels and a corresponding pair of oppositely disposed end panels wherein at least one of said end panels includes a web lock adapted to receive and secure the web flaps from the corresponding split cover panel; and

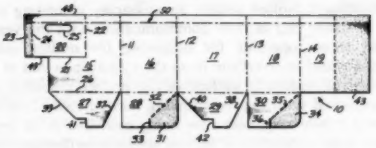
(c) a bottom interconnected to said substantially rectangular frame.

4,530,460

PARTITIONED CONTAINER WITH COLLAPSIBLE BOTTOM

Gordon L. Hinton, Portland, Tenn., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Jun. 20, 1984, Ser. No. 622,526
Int. Cl.[3] B65D *5/48*
U.S. Cl. 229—27 **4 Claims**



1. A blank for a container comprising

first, second, third, fourth and fifth side panels serially connected by first, second, third and fourth score lines,

said first and third side panels being of equal width,

said second and fourth side panels being of equal width,

a divider panel attached to said first panel by a fifth score line,

a glue flap attached to the outer side edge of said divider panel by a sixth score line,

the width of said divider panel between said fifth and sixth score lines being equal to the width of said second side panel,

said fifth said panel having a maximum width equal to the width of said first side panel and a minimum width greater than the distance between the free side edge of said first panel and said fifth score line,

a hand hold in said divider panel,

said divider panel havng a lower edge that is between the upper and lower edges of said first panel and being separated from said first side panel by a slit,

first, second, third and fourth bottom closure panels attached to the lower edge of said first, second, third and fourth side panels by a seventh score line,

the outer edge of said first and third bottom closure panels being parallel to said seventh score line,

the side edges of said first and third bottom closure panels being oblique and extending toward each other in the direction of said outer free edge,

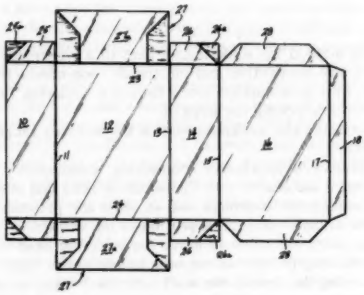
glue flaps attached to said second and fourth bottom closure panels by oblique score lines which extend from an inner corner of said second and fourth bottom closure panels, said glue flaps being attached to said second and fourth bottom closure panels only along said oblique score line.

4,530,461

SIFT RESISTANT ECONOMY SEAL CARTON

David J. Adamek, Minneapolis, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Nov. 2, 1983, Ser. No. 547,868
Int. Cl.[3] B65D *5/02*
U.S. Cl. 229—37 R **3 Claims**



1. A paperboard carton comprising:

(a) front, back and side panels hingedly connected in series to form a tubular carbon body;

(b) first end closure flaps hingedly connected to at least one end of each of said side panels, said first end closure flaps being smaller in area than one-half of the cross-sectional area of said tubular carton body, and said first end closure flaps each having a debossed portion thereon;

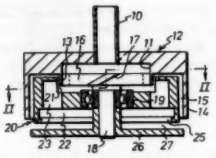
(c) a back panel end closure flap hingedly connected to said back panel, said back panel end closure flap being trapezoidal in configuration and being smaller in area than one-half of the cross-sectional area of said tubular carton body, the non-parallel edges of said back panel end closure flap overlapping said debossed portions of said first end closure flaps; and

(d) a front panel end closure flap hingedly connected to said front panel, said front panel end closure flap being substantially equal in area to the cross-sectional area of said tubular carton body, and said front panel end closure flap having an embossed central portion which overlies said back panel end closure flap and adjacent marginal debossed portions which overlie said first end closure flaps.

4,530,462
METHOD AND APPARATUS FOR SPREADING AND DISTRIBUTING A SOLID OR LIQUID PARTICULATE MATERIAL

Alf H. Andersson, Ödåkra, Sweden, assignor to Ingenjörsfirman Alf Andersson Handelsbolag, Ödåkra, Sweden

Filed Jul. 19, 1983, Ser. No. 515,301
Claims priority, application Sweden, Jul. 27, 1982, 8204467
Int. Cl.[3] A01C 7/08; B01D 45/14
U.S. Cl. 239—7 14 Claims

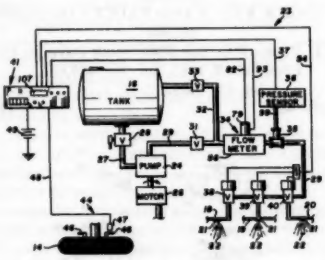


1. A method for spreading and distributing a solid or liquid particulate material which is supplied in the form of a flow of material pneumatically conveyed by a conveying gas, comprising the steps of directing the conveying gas containing the material into a centrifugal chamber in a separator having a buffer store and at least one exit point, centrifuging the material in said chamber to separate the material by centrifugation from the conveying gas, collecting the material in the buffer store, conducting the material from said buffer store to said at least one exit point in the separator, and flinging it out in a plane perpendicular to the axis of rotation of the centrifugal chamber.

4,530,463
CONTROL METHOD AND APPARATUS FOR LIQUID DISTRIBUTOR

Thomas K. Hiniker, Mankato, and Vincent N. Bush, Madison Lake, Minn., assignors to Hiniker Company, Mankato, Minn.

Filed Aug. 5, 1982, Ser. No. 405,323
Int. Cl.[3] A01M 7/00
U.S. Cl. 239—71 51 Claims

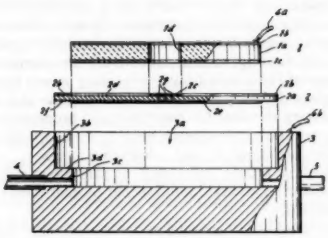


1. An apparatus for dispensing liquid comprising: a tank for storing a liquid, means for supporting the tank for movement relative to the ground, ground speed sensor means operable to provide a first electric signal related to the ground speed of the apparatus, pump means connected to the tank operable to draw liquid from the tank and discharge liquid, boom means having a plurality of nozzles for dispensing liquid onto a desired location, line means connected to the pump means and boom means for carrying liquid under pressure discharged from the pump means to said boom means, means for entering and storing at least one desired flow parameter, a liquid flow meter located in said line means for monitoring the actual flow rate of liquid in said line means, said flow meter including means for producing a second electrical signal related to said flow rate, first valve means located in said line means for controlling the flow rate of liquid in the line means, power means for regulating the first valve means to vary the flow rate of liquid in the line means relative to said actual flow rate and desired flow parameter, means to sense the pressure of the liquid in said line means downstream from said first valve means and provide a third electrical signal related to said second pressure, solenoid operated valve means in said line means adjacent said boom means operable either to allow liquid to flow into the boom means or to block the flow of liquid into the boom means, and control means responsivly coupled to said stored flow parameter and to said first, second and third electrical signals for controlling said power means to regulate the liquid flow rate to the boom means relative to said stored flow parameter and said first and second signals and for independently adjusting the flow rate relative to said second and third electrical signals whereby said liquid is distributed at a substantially uniform spray density independent of speed and pressure variations.

4,530,464
ULTRASONIC LIQUID EJECTING UNIT AND METHOD FOR MAKING SAME

Kazushi Yamamoto; Takeshi Nagai, both of Nara; Nobuyuki Hirai, Neyagawa, and Shunichiro Mori, Yamatokoriyama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jul. 11, 1983, Ser. No. 512,690
Claims priority, application Japan, Jul. 14, 1982, 57-123589
Int. Cl.[3] B23K 1/20
U.S. Cl. 239—102 11 Claims



8. An ultrasonic liquid ejecting unit comprising:

a piezoelectric transducer having a pair of first and second conductive films coated on opposite sides thereof, and an opening at the center thereof;

a body having a contact surface and a chamber behind said contact surface for holding liquid therein and an intake port connected to said chamber for supplying liquid thereto from a liquid supply source;

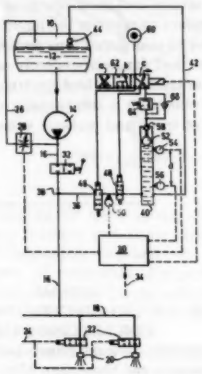
a metallic nozzle plate having a nozzle opening, first and second patterns of adjoining regions of cement-active and cement-inactive properties on opposite sides thereof, said cement-active region of the first pattern conforming to and secured to said second surface of said transducer by way of a layer of cementing material so that said nozzle opening is positioned within the opening of said transducer, said cement-active region of the second pattern conforming to and secured to said contact surface of said body by way of a layer of cementing material to define said chamber to thereby establish a pressure transmitting relationship with the liquid in said chamber.

4,530,465

METHOD AND DEVICE FOR CALIBRATING A REGULATED FLOW SPRAYING APPARATUS

Yves Gauchet, Montereau; André Crinquette, Villeneuve-la-Guyarde; Pascal Martinet, Libercourt, and Denis Lestradet, Moret sur Loing, all of France, assignors to Nodet Gougis, Montereau, France

Filed Dec. 17, 1982, Ser. No. 450,660
Claims priority, application France, Dec. 29, 1981, 81 24450
Int. Cl.³ G01F *11/10*; B05B *1/20*
U.S. Cl. 239—127 **10 Claims**



1. A flow regulated spraying apparatus of the type including a source of fluid under pressure, spray nozzles connected to said source of fluid through a line, regulation means for regulating the flow rate of said spray nozzles by varying the pressure of the fluid delivered to said spray nozzles, and control means for controlling the regulation means as a function of an external parameter and a calibration parameter; wherein the improvement comprises a calibration device comprising:

calculating means for calculating the calibration parameter;

flow rate sensing means operatively connected to said source of fluid, said flow rate sensing means including a chamber defining a predetermined volume and mans for measuring the time for emptying said predetermined volume, said flow rate sensing mean being adapted to deliver a flow rate signal to said calculating means;

a calibration nozzle connected to said flow rate sensing means for receiving fluid detected by said flow rate sensing means;

a manometric sensor adapted to detect a pressure representative of the fluid pressure in the proximity of said calibration nozzle and transmit a pressure signal to said calculating means; and

a contact line formed between said calculating means and said control means of said spraying apparatus.

4,530,466

SPRAY NOZZLE

Rodney G. Rounkles, Excelsior Springs, and Billy W. Holder, Rayville, both of Mo., assignors to Ethyl Molded Products Company, Richmond, Va.

Filed Jun. 17, 1983, Ser. No. 505,384
Int. Cl.³ B05B *7/32*
U.S. Cl. 239—327 **17 Claims**

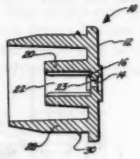
1. An integral spray nozzle for fitment to a container mouth, said spray nozzle comprising:

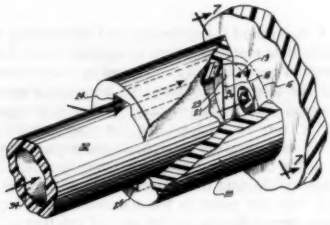
(a) means for fitting said spray nozzle to said container mouth in a substantially fluid-tight manner;

(b) an end wall having a planar inside wall portion with a dispensing orifice therethrough;

(c) a boss extending outwardly of said planar inside wall portion and having a circular planar boss wall which is concentric with said dispensing orifice and substantially parallel to said planar inside wall portion;

(d) a recess in said circular planar boss wall which provides at least a portion of a gas-liquid mixing chamber which is in fluid communication with said dispensing orifice, said recess having substantially parallel and opposed first and second planar walls of equal length, said first and second





planar walls lying along first and second chords, respectively, of the circle defined by said circular planar wall;

(e) a first means for providing substantially axial introduction of one of a gas or a liquid into said gas-liquid mixing chamber; and

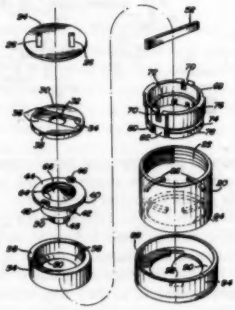
(f) a second means for providing substantially radial introduction of the other of said gas or said liquid into said gas-liquid mixing chamber.

4,530,467

ADJUSTABLE VALVE FOR FAUCET OR SHOWER HEAD

Humberto E. Bueno, P.O. Box 4186, South Daytona, Fla. 32021

Filed Feb. 9, 1983, Ser. No. 465,684
Int. Cl.³ B05B *7/12, 1/16*
U.S. Cl. 239—407 **17 Claims**



1. An adjustable valve for a faucet or shower head comprising a housing with means fixedly but detachably connecting the housing to a pipe having a supply of water communicated therewith, a valve assembly positioned in said housing, said

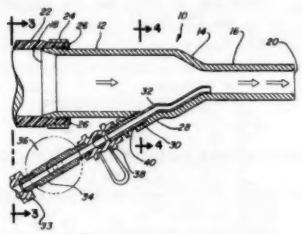
valve assembly including a stationary member and a movable member for opening and closing passageway defining means, an actuator disposed at the tip of the faucet or shower head to enable manual manipulation of the movable member forming part of the valve assembly and means interconnecting the actuator and the movable member of the valve assembly for actuating the valve assembly from the tip of the faucet or shower head, said stationary member being a restrictor having eccentric orifice means therein, said movable member being a rotatable valve plate disposed against the restrictor and including passageway defining means therein for selective registry with the orifice means in the restriction, said passageway defining means in the plate including an opening spaced radially from the orifice means in the restrictor and a radially extending passageway in the plate communicating with said opening and being selectively registrable with said eccentric orifice means during rotational movement of the valve plate.

4,530,468

REDUCED FIBER INSULATION NOZZLE

Henry Sperber, 8 Red Fox La., Englewood, Colo. 80111

Division of Ser. No. 265,258, May 19, 1981, Pat. No. 4,487,365.
This application Jun. 18, 1984, Ser. No. 621,846
Int. Cl.³ B05B *7/04, 7/14;* B05D *1/02*
U.S. Cl. 239—419.3 **13 Claims**



1. A fiber insulation application nozzle having a reduced sized outlet opening for applying fiber insulation particles discharging from an insulation blowing machine the nozzle comprising:

(a) a body portion having an inlet opening at one end, said inlet opening being attached to a transporting hose connected to said blowing machine, said body portion having an outside diameter which is approximately the same as said application hose;

(b) an exit portion which has a diameter which is smaller than said body portion;

(c) a transition portion positioned between said body portion and exit portion and arranged to provide a smooth conversion from the diameter of said body portion to the smaller diameter of said exit portion;

(d) a means for introducing an auxiliary stream gas into said nozzle in in a direction which is adjacent to and parallel to the inside surface of said exit portion whereby the fiberous insulation material being carried through the nozzle is aided by the auxiliary gas stream allowing it to be compressed in the transition portion and forced through the exit portion in a compressed pressurized manner whereby when the particles leave the exit portion of the nozzle they greatly expand into a fluffed condition due to the expending pressure surrounding the fiber particles; and

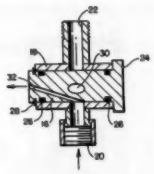
(e) said auxiliary gas stream means includes a connection means arranged on the outside of the body portion and a conduit means mounted within the nozzle, said conduit means having a portion positioned on the inside surface of said exit portion and having its outlet opening positioned adjacent to the inside surface of said exit portion so that the auxiliary gas stream flows along and parallel to the surface of the exit portion so as to force the pressurized fiber insulation particles from the outlet opening of the nozzle so that they can be expanded to a light fluffy condition to enhance their insulating characteristics.

4,530,469

SUPPLY/SHUT-OFF VALVE

Jack E. Muck, Garfield Heights, Ohio, assignor to AccuSpray, Inc., Cleveland, Ohio

Filed Oct. 21, 1983, Ser. No. 544,219
Int. Cl.³ B05B *9/00*
U.S. Cl. 239—569 **6 Claims**



1. In the combination of an air supply line serving as a manifold, one end of each of a plurality of branch lines being connected in fluid communication with said manifold, means for connecting an air using unit to the other end of each of said branch lines, means in each air using unit for starting and stopping air flow through the unit, and a valve connected within each branch line intermediate its ends,

each branch being configured to supply air from said manifold in some predetermined amount to the connecting means,

each said valve including a hollow body with an inlet and an outlet, said inlet being connected in fluid communication with the manifold and its associated branch line, said outlet being in fluid ocmmunication with the air using unit,

the hollow of the body containing a rotary plug having means forming a passageway therethrough, means for rotating the plug relative to the body for aligning the passageway within the body to conduct air from said inlet to said outlet, means for forming at least one sliding seal between the body and the plug for preventing undesired air leaks to the atmosphere,

means forming an aperature in said plug, one end of said aperture being in fluid communication with the atmosphere, the other end of said aperture being configured to terminate in a position at the surface of said plug which may be aligned with the inlet to the body,

the plug, passageway means and aperture means being configured to alternatively (1) stop all air flow through the body, (2) bleed air through the aperture while some air from the inlet continues to traverse the passageway means from the inlet to the outlet, (3), allow air to traverse the passageway means only and (4) bleed air through the aperture only.

4,530,470

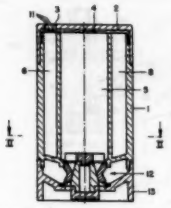
CONDIMENT DISPENSER

Kurt H. Beilstein, Langenselbold, Fed. Rep. of Germany, assignor to Hofmann GmbH, Kreuzwertheim, Fed. Rep. of Germany

Filed Apr. 19, 1983, Ser. No. 486,333
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1982, 3214293; Dec. 6, 1982, 3245065
Int. Cl.³ B02C *19/12*
U.S. Cl. 241—169.1 **10 Claims**

1. A condiment dispenser comprising a tubular housing, a semitubular wall having a pair of longitudinal end edges, and a plurality of dividing walls connecting said semitubular wall to said housing for dividing said housing into a mill chamber and

a plurality of juxtaposed condiment compartments arranged annularly about said mill chamber, said condiment compartments being separated from each other and from said mill chamber by said walls, two of said dividing walls connecting said semitubular wall end edges to said housing to define an enlarging chamber connecting said mill chamber to said housing so said mill chamber extends with an enlargement to said housing, and a condiment mill connected to said mill chamber for material to be ground by said mill and provided with an outlet for ground material located at a lower end face of the dispenser, said condiment mill being provided with a rotatable



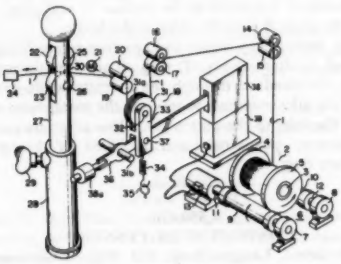
ring relative to said housing, the lower end face of said ring forming the base surface of the condiment dispenser, and a cover releasably secured to said housing, said cover including sprinkling apertures located to cooperate with each condiment compartment so condiments can be discharged from said condiment compartments via said cover, said cover further including a charging aperture on said cover adjacent to at least one of said sprinkling apertures and located to cooperate with said enlarging chamber so material to be ground in said mill can be charged into said mill chamber via said enlarging chamber, said cover further including a closure means associated with each aperture for closing said end aperture.

4,530,471

METHOD OF AND APPARATUS FOR DISPENSING WIRE FROM A WIRE STORAGE SPOOL

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Mar. 2, 1982, Ser. No. 353,945
Claims priority, application Japan, Mar. 5, 1981, 56-30554
Int. Cl.³ B65H *59/38*
U.S. Cl. 242—45 **19 Claims**



1. A method of dispensing thin, electrically conductive wire from a massive wire storage spool to feed the wire as a continuous, traveling electrode into, and continuously transport it through, a cutting zone defined in a traveling-wire electroerosion machine, the method comprising the steps of:

supporting the massive wire storage spool rotatably on rotary support means in a space adjacent the electroerosion machine;

spanning the wire leading from said storage spool on a plurality of wire guides in said machine through outlet wire guide means disposed at an outlet side of said space and adjacent the machine to establish a continuous stretch of the wire between said storage spool in said space and said cutting zone in said machine;

establishing the vertical position of said outlet guide means in relation with the electroerosion machine;

rotationally driving said rotary support means by energizing electric motor means drivingly coupled therewith in said space to rotate said storage spool while applying a traction drive to said continuous stretch at least in part by means of a capstan arranged in said machine to allow the electrode wire on said spool to be unwound therefrom and to be advanced via said outlet guide means into and through said cutting zone;

controlledly energizing said electric motor means rotating said rotary support means so as to maintain the tension of the advancing wire between said outlet wire guide means and said storage spool substantially constant; and

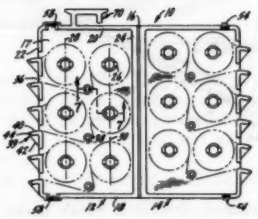
electrically shielding said space to prevent or reduce emission of electrical noise generated therein.

4,530,472

WIRE MARKER DISPENSER

Roy N. Voss, Fairdale, and Marvin J. Peplow, Sycamore, both of Ill., assignors to Ideal Industries, Inc., Sycamore, Ill.

Filed Jun. 21, 1984, Ser. No. 623,093
Int. Cl.³ B65H *19/04, 49/18*
U.S. Cl. 242—55.3 **10 Claims**



1. In a dispenser for marking tapes and the like, a generally flat housing with a cover defining therewith a generally open interior cavity for housing a Plurality of tape spools, a plurality of openings in one side of the housing through which the tape from the spools may be withdrawn for use, a plurality of mountings in the housing for the tape spools disposed in two rows, one nearer the openings than the other, and guides in the housing between the rows and offset relative to the row nearer the openings so that the tapes from the far row, when passed about one of the guides on its way to an opening, will not contact the tape rolls on the near row of mountings, the cover having an open interior with a plurality of side openings, mountings and offset guides corresponding to but reversed from those in the housing.

4,530,473

APPARATUS FOR APPLICATION OF PLASTICS STRETCH FILMS

John C. Parry, 6729 Brookmont Dr., Baltimore, Md. 21207

Filed Feb. 4, 1983, Ser. No. 454,144
Int. Cl.³ B65H *75/38*
U.S. Cl. 242—55.3 **6 Claims**

1. An apparatus for manually applying plastics stretch films for packaging units, comprising:

a pair of core means, each said core means of said pair of core means having a first end and a second end, each said core means of said pair of core means being hollow and tube-like;

a supply of plastics stretch film on each of said pair of core means, said supply of plastics stretch film on each of said

pair of core means being located and rolled upon each respective core means near and spaced slightly from each of said first ends thereof, said spacing of said supply of plastics stretch film on each of said pair of core means from each said first ends being substantially less than the resulting extended spacing of said supply of plastics stretch film on each of said pair of core means from said second ends of each of said core means of said pair of core means;

a pair of hand grip means, each of said pair of hand grip means having an inboard open end and an outboard end, one of said pair of hand grip means with its open end being

slideably and removably placed upon said second end of one of said core means of said pair of core means, the other of said pair of hand grip means with its open end being slideably and removably placed upon said second end of the other of said core means of said pair of core means, each of said hand grip means of said pair of hand grip means having its open end spaced from its respective supply of said plastics stretch film; and

a coupling means, said coupling means being rod-like in configuration, said coupling means being concurrently removably and slideably inserted into said first ends of said core means for coupling said pair of core means together.

4,530,474

BRAKING DEVICE FOR MOTOR-DRIVEN REELING DEVICES

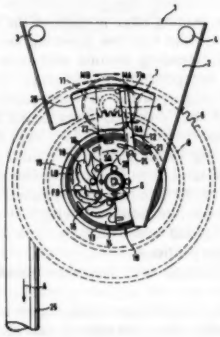
Bill P. P. Nederman, F.M. Franzén Gata 2, S-252 28 Helsingborg, Sweden

Filed Dec. 21, 1983, Ser. No. 563,808

Claims priority, application Sweden, Dec. 21, 1982, 8207284

Int. Cl.³ B65H *17/46*

U.S. Cl. 242—84.52 R **11 Claims**



1. A braking device for a motor driven reeling device comprising:

a reeling drum;

controllably applicable brake means for braking rotational movement of said reeling drum;

a motor drivingly engaging a drive ring on said reeling drum and pivotably mounted eccentricly of the axis of said reeling drum for movement along an arcuate path the center of which lies on the axis of said reeling drum; and

movement transferring means operatively interposed between said motor and said brake means for controllably applying said brake means in response to movement of said motor along said arcuate path.

4,530,475

MAGNETIC TAPE CASSETTE WITH WINDOWS

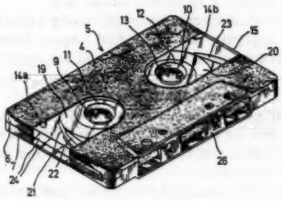
Ottmar Buerkle, Offenburg; Kurt Schmidts, Kehl, both of Fed. Rep. of Germany; Alfred Schneider, Hoenheim, France, and Walter Schuett, Kehl, Fed. Rep. of Germany, assignors to Basf Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 410,839, Aug. 23, 1982, abandoned. This application Jul. 9, 1984, Ser. No. 629,128

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1981, 8124876[U]

Int. Cl.³ G03B *1/04;* **G11B** *15/32*

U.S. Cl. 242—199 **15 Claims**



1. A tape cassette, especially a magnetic tape cassette, comprising a cassette housing having upper and lower parts and at least one hub or reel contained therein, and windows which are formed by apertures in at least one of said parts of the housing and transparent members covering the said apertures,

wherein said cassette comprises at least two windows each covered by one of said transparent members, a common carrier carrying said at least two transparent members adjacent opposite ends of said carrier, and a housing separator member disposed in said housing part between said windows, said common carrier consisting of webs which connect the said at least two transparent members, and

wherein the at least one housing part, in which the windows are formed, is provided at its inner surface with recesses for the correct positioning of said webs and said transparent members.

4,530,476

ORDNANCE DELIVERY SYSTEM AND METHOD INCLUDING REMOTELY PILOTED OR PROGRAMMABLE AIRCRAFT WITH YAW-TO-TURN GUIDANCE SYSTEM

Charles H. Thurber, Jr.; Frederick A. Behrens, both of Springfield, and John H. Hunton, Annandale, all of Va., assignors to E-Systems, Inc., Dallas, Tex.

Filed Aug. 12, 1981, Ser. No. 292,260

Int. Cl.³ F41G *7/22;* **F41F** *3/00;* **F42B** *15/16*

U.S. Cl. 244—3.21 **14 Claims**

1. A system for guiding an expendable pilotless aircraft to an electromagnetic wave energy emitting target comprising:

(1) an aircraft having:

(a) control surfaces asymmetrical in the pitch and yaw planes,

(b) an electromagnetic energy sensor mounted in a forward position thereof for generating error signals representing the difference between the longitudinal axis of the aircraft and the line-of-sight to the detected electromagnetic wave energy in the pitch and yaw planes with a maximum error between about seven degrees and about ten degrees,

(c) a signal processing circuit;

(d) a programmable flight profile controller carried by said aircraft, and

(e) a guidance system carried by said aircraft for controlling said control surfaces, said guidance system being responsive to a said flight profile controller in the initial portion of the flight of the aircraft and being responsive to said signal processing circuit in the terminal portion of the flight of the aircraft, said guidance system being operative in said terminal portion of the flight of said aircraft in a yaw-to-turn mode with a substantially zero yaw roll rate,

(f) a frame,

(g) a pair of wings and a pair of horizontal stabilizers foldably carried by said frame,

(h) a side force generator foldably carried by each of said wings,

(i) a rearwardly facing or push propeller,

(j) an engine for driving said propeller,

(k) a fuel cell receiving recess,

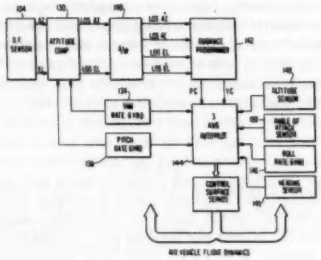
(l) an ordnance receiving recess, and

(m) electrical circuit means including a quick release plug for applying power to said engine from an external source of electrical power and for applying programming data from an external source of programming data to said flight profile controller;

(2) a fuel cell adapted for insertion into said fuel cell receiving recess for operative connection to said engine;

(3) an ordnance adapted for insertion into said ordnance receiving recess;

(4) a generally rectangular crate for said aircraft, said crate having:



(a) a top panel,

(b) upright side and end panels,

(c) a base member having a propulsion unit receiving recess extending inwardly from one of said end panels toward the other of said end panels, said upright side and end panels and said top panel being removable from said crate to leave said aircraft releasably supported on said base member,

(d) lifting means adjacent said top panel,

(e) launching rail engaging guide means depending from said base member adapted for sliding engagement with a launching rail,

(f) a solid fuel rocket adapted for insertion into the propulsion unit receiving recess in said base, and

(g) means carried by said base for removably connecting said base to said aircraft to impart forward thrust from said rocket through said base to said aircraft and for separating said base from said aircraft upon the extinguishing of said rocket; and

(5) a vehicle having:

(a) means for carrying a plurality of aircraft filled crates,

(b) a launching rail,

(c) means for selectively loading one of said plurality of crates on said launching rail with the guide of the base member of said crate means in engagement therewith so that said upright side and end panels and said top panel can be removed from said base member leaving said aircraft on said base member in position, when said wings, horizontal stabilizers and side force generator are unfolded, to be launched with said base member by the firing of said rocket,

(d) a source of electrical power with a connect-disconnect plug adapted for connection to the engine of said aircraft; and

(e) a source of program data with a quick connect-disconnect plug adapted for connection to the flight profile controller of said aircraft.

4,530,477

FLUTTERING KITE

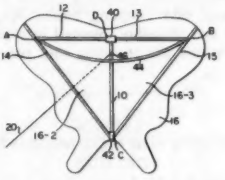
Toshio Ito; Akemi Futakawa, both of Amagasaki, and Osamu Nakazaki, Nakatsugawa, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 697,271, Jun. 17, 1976, abandoned. This application Mar. 16, 1984, Ser. No. 590,288

Claims priority, application Japan, Jun. 26, 1975, 50-79877; Jun. 26, 1975, 50-79878; Jun. 26, 1975, 50-79879; Jun. 26, 1975, 50-79880; Jun. 26, 1975, 50-79881; Jun. 26, 1975, 50-90480[U]; Jun. 26, 1975, 50-90656[U]; Jul. 1, 1975, 50-81603; Jul. 1, 1975, 50-81604; Jul. 1, 1975, 50-92611[U]; Jul. 2, 1975, 50-93059[U]; Jul. 31, 1975, 50-93558; Jul. 31, 1975, 50-93559; Jul. 31, 1975, 50-93560; Apr. 21, 1976, 51-50659[U]

Int. Cl.[3] B64C *31/06*

U.S. Cl. 244—153 R **19 Claims**



1. A kite having a leading edge portion and a trailing edge portion, comprising:

a V-shaped main frame including a pair of stiff elongated ribs relatively positioned symmetrically relative to a central axis of symmetry of the Vee to define a Vee with an apex toward the trailing edge portion of the kite and opening toward the leading edge portion of the kite;

a flexible sheet-like member covering said V-shaped main frame and extending beyond said main frame having a periphery independent of said main frame including a peripheral edge portion at least partially opposite the opening of the V-shaped main frame and defining the leading edge portion of the kite, said flexible sheet-like member being folded along the central axis of symmetry of said V-shaped main frame to define the central axis of symmetry of the kite and two symmetrical halves of the kite, said sheet-like member having a symmetrical leading edge portion and approximately symmetrical lateral and trailing edge portions;

means for fastening said sheet-like member to said main frame;

a first pair of elongated auxiliary frame members disposed symmetrically about the central axis of symmetry of the kite extending along a central longitudinal portion thereof from within said main frame and beyond said main frame back toward the trailing edge portion of the kite, and between said main frame and the sheet-like member, said first pair of elongated auxiliary frame members being resilient and flexible but sufficiently stiff to impart stiffness to said sheet-like member at portions thereof outside of said main frame and to help distribute tension within said sheet-like member;

means for fastening said first pair of auxiliary frame members to said sheet-like member;

a second pair of auxiliary frame members disposed symmetrically about the central axis of symmetry of the kite and

along the leading edge portion of the kite, said second pair of auxiliary frame members extending from within said main frame beyond said main frame and between said main frame and said sheet-like member, said second pair of auxiliary frame members being flexible and resilient but sufficiently stiff to impart stiffness to the leading edge portion of the kite and to help distribute tension within said sheet-like member;

means for fastening said second auxiliary frame members to said sheet-like member;

an elastic spacer connected to the respective elongated ribs closer to the open end of said Vee than to the apex of said V-shaped main frame and spanning therebetween to set in cross section of the kite an initial angular separation between the two halves of the kite, said spacer flexing under increases in wind pressure applied to said two halves of the kite to permit the angular spacing between said two kite halves to decrease in response to the wind pressure increase and to maintain the two kite halves angularly spaced, and for restoring the two kite halves to the initial angular spacing when the wind pressure acting on the two kite halves decreases; and

means for fixing said elastic spacer to said two elongated ribs.

4,530,478

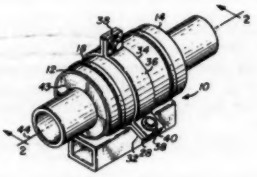
INSULATING PIPE SUPPORT APPARATUS

William F. McClellan, San Jose, Calif., assignor to Pipe Shields, Inc., Vacaville, Calif.

Continuation of Ser. No. 375,352, May 6, 1982,. This application Mar. 28, 1984, Ser. No. 594,423

Int. Cl.³ F16L *3/00*

U.S. Cl. 248—62 **15 Claims**



1. An insulating pipe support apparatus comprising:

a support for pipes which undergo longitudinal movement caused by thermal distortion including a cylindrical frame having an interior with at least one high compressive-strength thermally insulating insert, said insert being of a strong, compression resistant material, said insert defining a ring adapted to snugly receive through its central aperture a pipe for carrying fluids, which vary greatly from an ambient temperature;

means for distributing load on the pipe support, the means located on the exterior of the frame and including a base member generally parallel to the support longitudinal axis and extending the entire length of the support, said base member being adapted to slidably rest on a pipe rack, whereby said base member may travel along a longitudinal axis of said pipe, and a strap means connected to the base member and engaged in a 360° compression contact with the exterior of the frame for transferring the load borne by the load-bearing insert to the base member, whereby the load borne by the load bearing insert is transferred from that insert to the base member through the strap means throughout the range of the pipe's longitudinal travel, thereby distributing the load throughout the base member.

4,530,479

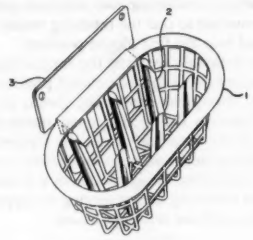
SOAP BASKET

Jason K. Chen, No. 17 La. 541, Sung Shan Rd., Taipei, Taiwan

Filed Oct. 7, 1983, Ser. No. 539,812

Int. Cl.³ A47F *5/00*

U.S. Cl. 248—309.1 **6 Claims**



1. A basket assembly, comprising:

a basket composed of a grille-like frame work formed of a plurality of longitudinal frame members and a plurality of transversal frame members cross joined with said longitudinal frame members, a flange on the upper edge of the basket having a tongue bent downward, and a plurality of mounting studs at selected points of said transversal frame member at the bottom of the basket;

a holder composed of a plurality of bar members oppositely and spacially arranged in two rows having lower parts connected by a cross-formed frame work, each one of said bar members being generally disposed upright and having a lower end provided with a blind mounting hole to be engaged with one of said studs of said basket, and a pair of forks having a slot in which said transversal frame member fits, said pair of forks having a pair of projections from the inner side of the end of the forks for enfolding the transversal frame member; and

a hanger plate having means for hanging said basket.

4,530,480

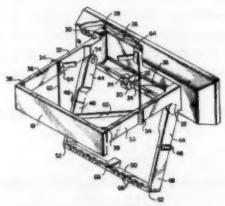
COLLAPSIBLE CUP HOLDER

Michael J. Pratt, 1997 Pheasant Way, Salt Lake City, Utah 84121

Filed Apr. 11, 1983, Ser. No. 483,493

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—311.2 **16 Claims**



1. An apparatus for holding a container, comprising:

means for supporting a lower portion of a container, said supporting means being movable between a first closed position and a second open position such that when the supporting means is in said second open position, the supporting means is capable of engaging and bearing the weight of the container;

means for retaining the container in a predetermined position, said retaining means being movable between a first closed position and a second open position such that when

the retaining means is in said second open position the retaining means minimizes substantial movement of the container positioned on the supporting means, said retaining means being substantially U-shaped and including a front bar and two side bars, said front bar being hingedly secured to one end of each side bar, and the other end of each side bar being hingedly secured to mounting means, each side bar including two side bar members hingedly interconnected so that the retaining means is adapted to be collapsed into the first closed position;

means for releasably securing the supporting means and the retaining means in the first closed position;

means for biasing the supporting means and the retaining means towards the second open position so that upon release of the securing means, the supporting means and the retaining means move to the second open position; and

means for mounting the apparatus in a predetermined position, said mounting means serving to support the supporting means and the retaining means.

4,530,481

SEAT RAIL

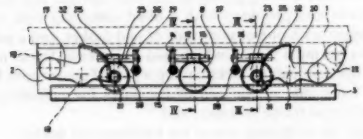
Bernd Klüting, Radevormwald; Peter Ebeling, Remscheid, and Willibald Strowik, Remscheid-lennep, all of Fed. Rep. of Germany, assignors to Keiper Recarco GmbH & Co., Fed. Rep. of Germany

Filed Jun. 13, 1983, Ser. No. 503,552

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1982, 3221959

Int. Cl.³ A45D *19/04*

U.S. Cl. 248—394 **16 Claims**



1. A seat rail for vehicle seats, particularly for motor vehicle seats comprising:

a guide rail;

a seat rail housing comprising two half shells joined together to form a hollow casing, each half shell having a lower edge, the lower edges of said half shells forming a slide rail, said seat rail housing being movable longitudinally in said guide rail;

means for longitudinally adjusting the position of said seat rail, said adjusting means comprising a first gear mounted in said housing, second gears mounted on each side of said first gear in fixed relation thereto, and a toothed element mounted on said guide rail and enmeshed with said second gears; and

means disposed in said housing for driving said first gear.

4,530,482

PICTURE MOUNT AND SYSTEM FOR HANGING PICTURES

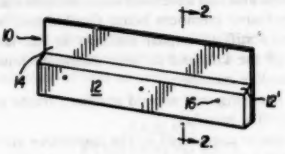
Robert Berinson, 203 Leighton Ave., Silver Spring, Md. 20901

Filed May 11, 1981, Ser. No. 262,518

Int. Cl.³ A47F *7/14*

U.S. Cl. 248—475.1 **1 Claim**

1. A wall system for firmly hanging pictures on a wall wherein the wall mount is a long elongated transparent resinous strip whose length extends the full width of a wall in a room to become a permanent part of said wall, said strip having a lower thickened portion and an upper thinned portion so that when mounted contacts said wall and wherein the picture mount having a knife edge interfits between said wall and said wall mount to frictionally fasten the picture to said wall, and wherein the thickness of said knife edge is about 0.05 millimeters and the base about 4 millimeters thick, and wherein an



electric socket is emplaced at a suitable spaced point along the wall mounted strip.

4,530,483

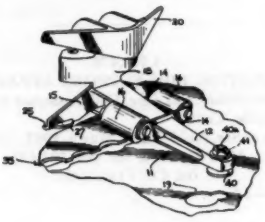
SIDE GUIDE FOR CARGO LOADING SYSTEM

Arnold B. Nordstrom, Torrance, Calif., assignor to Ancra Corporation, El Segundo, Calif.

Filed Sep. 30, 1982, Ser. No. 426,761

Int. Cl.³ A47B *97/00*

U.S. Cl. 248—500 **7 Claims**



1. A side guide assembly for guiding a pallet for loading in a vehicle, said side guide assembly being mounted in a track member having alternate cutout and lip portions comprising:

a frame having an elongated arm portion, one end of said arm portion having an opening formed therein,

roller means,

means for rotatably supporting said roller means on said arm portion,

a guide plate extending from said arm portion towards the roller means in a direction substantially normal to the longitudinal axis of the arm portion,

an overhanging member extending substantially normally from said guide plate towards the end of said arm portion having the opening formed therein,

said guide plate and overhanging member operating to guide the pallet for movement on said roller means along an axis substantially normal to the longitudinal axis of said arm portion,

cross arm means running transversely to the longitudinal axis of said arm portion,

tension lug means extending from the cross arm means in a direction, substantially opposite to that of the overhanging member, said tension lug means being located along a lower edge of said cross arm means,

shear lug means spaced on said frame from said tension lug means towards said guide plate and extending from the frame in a direction substantially opposite to that of said tension lug means,

retainer stud means mounted on the vehicle floor and extending upwardly therefrom for engaging the opening portion in the end of the arm portion of said frame,

said tension lug means being fitted in said track under the lip portions thereof with said shear lug means being fitted in the cutout portions of the track in shear abutment thereagainst and the opening portion of the elongated arm portion being fitted over the retainer stud means, and

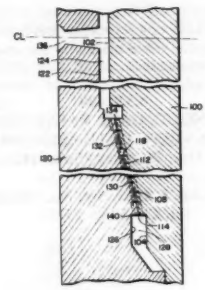
means for retaining the opening portion of the arm portion of the arm portion of the frame to said floor mounted retainer stud means.

4,530,484

MOLD FOR MOLDING WHEEL COVER HAVING SPOKE-LIKE PORTIONS

Yuko Baba, Yokohama, Japan, assignor to Nissan Motor Co., Ltd. and Hashimoto Forming Kogyo Co., Ltd., both of Yokohama, Japan

Filed Jun. 22, 1984, Ser. No. 623,685
Claims priority, application Japan, Jun. 30, 1983, 58-118848
Int. Cl.³ B29D *3/02*; B22C *9/28*
U.S. Cl. 249—56 **3 Claims**



1. A mold for molding a melted material into a wheel cover member for a vehicle road wheel, the wheel cover member being a one-piece member having a plurality of spoke-like portions extending from a central portion of the cover member to a generally annular radially outer peripheral portion of the cover member obliquely with respect to the radii of the cover member and also with respect to the center axis of the cover member such that said central portion is held axially outward from said peripheral portion, the mold having first and second mold members correspondingly shaped so as to provide a first cavity to form said central portion, a second cavity to form said peripheral portion and a third cavity which connects said first and second cavities and in which said spoke-like portions are formed when the mold is closed by contact of the first and second mold members with each other,

characterized in that said first mold member has a portion generally in the shape of a truncated pyramid of which the side faces provide a first group of flat surfaces slanting with respect to the center axis of the mold and of which the edges between the base thereof and said side faces are adjacent said second cavity, that the second mold member is recessed so as to provide a second group of flat surfaces which are respectively opposite to and can mate with the flat surfaces of said first group, and that at least one of (i) said first group of flat surfaces and (ii) said second group of flat surfaces are formed with elongate and straight grooves which provide said third cavity.

4,530,485

VALVE

John H. Yonker, 2212 San Simeon Pl., Carrollton, Tex. 75006; Charles R. Williams, 3108 Afton, Carrollton, Tex. 75007, and Otto J. Granhaug, Esso Exploration and Production Norway, Inc., P.O. Box 560, 4001 Stavanger, Norway

Filed Aug. 9, 1984, Ser. No. 639,266
Int. Cl.³ E21B *34/10*
U.S. Cl. 251—93 **3 Claims**

1. A subsurface safety valve comprising,

a tubular body,

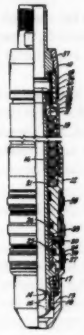
a valve seat and valve member in the body controlling flow there through,

a valve operator for the valve member reciprocal by resilient means toward valve closed position and toward valve-open position by control pressure fluid,

a snap ring lock groove in the body,

a snap ring,

a prop-out stop on said valve operator expanding said snap



ring into said lock groove and abutting said ring to releasably maintain the valve member in partially open position against the force exerted by said resilient means, and

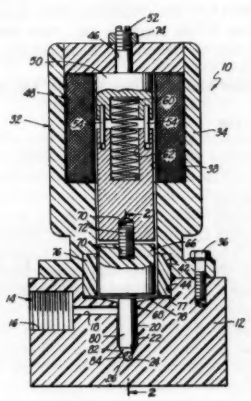
a receiving groove in the valve operator on the side of the prop-out stop remote from said valve member for receiving the snap ring in a position to clear said lock groove upon movement of said valve operator toward complete valve-open position in response to control pressure fluid to render the valve operational.

4,530,486

VALVE

Miro Rusnak, LaVerne, Calif., assignor to City of Hope National Medical Center, Duarte, Calif.

Filed Feb. 9, 1983, Ser. No. 465,245
Int. Cl.³ F16K *31/06*, *1/38*
U.S. Cl. 251—129 **2 Claims**



1. A valve having a valve body shaped so as to include an inlet cavity, an outlet cavity an opening extending between said cavities and a valve seat located adjacent to and around said opening, said valve also having a closure member capable of seating against said seat when in a closed position so as to

close off said opening, a stem extending from said closure member for use in supporting said closure member and in transmitting movement to said closure member and co-acting means connecting said valve body and said stem for use in moving said closure member between said closed position and an open position in which said closure member is spaced from said seat in which the improvement comprises:

said body being shaped so that there is a smooth internal surface within said outlet cavity extending around said opening, said closure member being shaped so as to include a terminal surface which, when said closure member is in said closed position, appears as a continuation of the internal surface of said outlet cavity located around said opening,

said terminal surface and said internal surface of said outlet cavity being shaped so that there is no space between said closure member and the interior of said outlet cavity in which material can accumulate or be held,

said seat is beveled so as to open outwardly into the interior of said inlet cavity,

said closure member has a beveled surface which seats against said valve seat,

said outlet chamber includes a cylindrical bore which is separated from said inlet cavity by said opening,

said terminal surface is a cylindrical surface having the same diameter as said cylindrical bore,

and including guide means for controlling the motion of said valve closure member so that said closure member can only seat against said valve seat in a position which said cylindrical surface appears as a continuation of said cylindrical bore,

said closure member and said valve seat are both formed of normally inert materials one of which is softer than the other,

said co-acting means includes spring means for biasing said closure member against said valve seat, said spring means being capable of exerting sufficient force so as to cause deformation of the softer of said materials in forming a seal, and

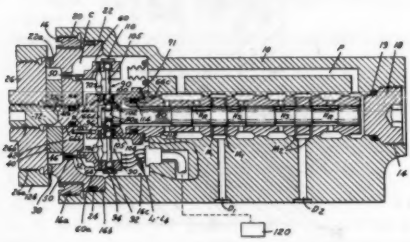
said guide means comprises a flexible diaphragm which extends outwardly from said stem around said stem and which has a periphery, said periphery being held against said body so as to seal off the interior of said inlet cavity.

4,530,487

DIRECT DRIVE SERVOVALVE AND FUEL CONTROL SYSTEM INCORPORATING SAME

Sydney K. Tew, 50338 Baytown Dr., New Baltimore, Mich. 48047, and Dan O. Bauer, 277 Kenwood Ct., Grosse Pointe Farms, Mich. 48236

Filed Mar. 16, 1984, Ser. No. 590,243
Int. Cl.³ F16K *31/02*
U.S. Cl. 251—138 **42 Claims**



1. A direct drive valve comprising:

(a) housing means,

(b) valve means movable disposed in the housing means,

(c) magnet means and coil means in the housing means with one of said magnet means and coil means having bore means and being movable relative to the other when said coil means is energized,

(d) means for movably supporting said one of said magnet means and coil means in said housing means,

(e) a portion of said valve means extending within the bore means of said one of said magnet means and coil means,

(f) pivot support means in the housing means extending within the bore means of said one of said magnet means and coil means between said one of said magnet means and coil means and said portion of said valve means therein,

(g) lever means having a first portion coupled to and actuated by said one of said magnet means and coil means, a second portion coupled to and actuating the valve means and an intermediate portion between said first portion and second portion pivotally supported on said pivot support means, and

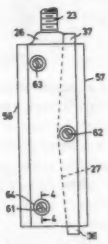
(h) means for energizing the coil means to impart movement to said one of said magnet means and coil means which is transmitted to the valve means by the lever means.

4,530,488

THROUGH CONDUIT GATE VALVE WITH DOUBLE EXPANDING GATE ASSEMBLY

Willard E. Kemp, One Riverway, Suite 2420, Houston, Tex. 77056

Filed Jul. 5, 1983, Ser. No. 510,638
Int. Cl.³ F16K *25/00*
U.S. Cl. 251—167 **7 Claims**



1. In a gate valve having a body with a valve chamber intersecting a flow passage, an expanding metal gate valve assembly mounted for movement in the body and within the chamber between opened and closed positions across the flow passage, the gate assembly comprised of a gate element and a segment having smooth parallel faces for engaging metal backed sealing rings mounted in recesses in the body about the flow passage, the gate element having a vee recess and the segment having a complementary vee face fitted into this recess with the gate element and segment in a collapsed condition for providing a minimum dimension between their parallel faces, whereby the gate assembly moves in collapsed condition between opened and closed position and is actuated into a substantially expanded maximum dimension between these parallel faces for tightly engaging the sealing rings at the opened and closed position, the improvement comprising:

(a) gate assembly control means integral with the gate assembly for restraining metal-to-metal engagement of the sealing rings against the parallel face of the gate element and segment in their collapsed condition during movements between opened and closed positions;

(b) said gate assembly control means in said gate assembly having a parallel edge aligned with the axis of movement between opened and closed positions, metal guide strips mounted on said edges and positioned to ride in metal-to-metal contact with said sealing rings and said metal guide strips having a thickness of a dimension greater than the minimum dimension but less than the maximum dimension of said gate assembly in its collapsed and expanded conditions, respectively; and

(c) in said gate assembly, said gate element and segment mount said metal guide strips to said edges of said gate element and said segment by elastic suspension means, and said elastic suspension means biasing said gate element and said segment into the collapsed condition during movement of said gate assembly between opened and closed positions.

4,530,489

SPRING LOAD ADJUSTING DEVICE FOR CUSHIONING EQUIPMENT

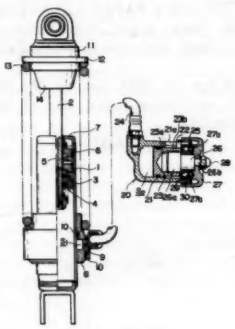
Masahiro Hirano, and Sumio Nakayama, both of Shizuoka, Japan, assignors to Kabushiki Kaisha Showa Seisakusho, Tokyo, Japan

Filed Apr. 29, 1983, Ser. No. 489,747

Claims priority, application Japan, May 17, 1982, 57-71822[U]; May 17, 1982, 57-71823[U]

Int. Cl.³ F16F *5/00, 9/44*

U.S. Cl. 267—34 **12 Claims**



1. A spring load adjusting device for cushioning equipment including a hydraulic damper having a cylinder and a rod with a piston, a coil spring extending between said cylinder and said rod, and a pressure chamber provided at one end of said coil spring, said pressure chamber hydraulically controlling a spring load of said coil spring, comprising:

a tank cylinder hydraulically connected to said pressure chamber;

a piston member slidably fitted in said tank cylinder;

a cover for closing an open end of said tank cylinder;

an adjust screw member having a threaded portion, extending through said cover and being adapted by rotating operation thereof to cause said piston member to slide;

a knob integrally fastened with the outer end of said adjust screw member;

protection means for protecting said threaded portion of said adjust screw member;

said protection means comprising a cylindrical wall extending axially along at least a part of the outer circumference of said threaded portion;

said threaded portion being formed in an inner end portion of said adjust screw member extending in said tank cylinder; and

said cylindrical wall of said protection means being integrally formed with said piston member and screwed on said threaded portion of said adjust screw member.

4,530,490

FIBER-REINFORCED PLASTICS LEAF SPRING

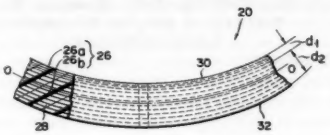
Atsushi Misumi, and Shuji Hiromoto, both of Yokohama, Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Filed Aug. 3, 1983, Ser. No. 520,077

Claims priority, application Japan, Aug. 20, 1982, 57-125586[U]

Int. Cl.³ F16F *1/20*

U.S. Cl. 267—47 **10 Claims**



1. An FRP leaf spring which comprises a plurality of continuous fibers arranged to extend within a number of adjacent thickness ranges of the leaf spring, and a resin in which said plural continuous fibers are embedded, said continuous fibers being of such diameter as corresponds to the position of that thickness range of the leaf spring in which said fibers are embedded, wherein the fibers in each of said thickness ranges have a diameter which is different from the diameters of the fibers in a next adjacent thickness range.

4,530,491

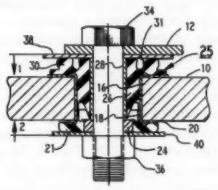
COMPACT LOW-FREQUENCY ENGINE MOUNTING

James H. Bucksbee, McKean, and Andrew D. Campany, Erie, both of Pa., assignors to Lord Corporation, Erie, Pa.

Filed Nov. 23, 1983, Ser. No. 554,747

Int. Cl.³ F16F *15/08*

U.S. Cl. 267—141 **7 Claims**



1. A resilient load supporting and motion accommodating mounting for interconnecting supported and supporting members, at least one of said members having an opening therein, comprising:

a rigid outer sleeve element having a main section and a flange projecting generally radially outwardly from one end of said main section, said main section being disposed within and having a slip-fit relationship with said opening of said one of said members, said flange overlying an exterior surface of said one of said members and being disposed in spaced confronting relationship to a surface of the other of said members;

a rigid inner tubular element disposed within said opening of said one of said members and having a portion projecting from said opening toward the other of said members;

a unitary body of elastomer bonded to said rigid sleeve element and to said rigid tubular element;

said body including a first annular portion disposed between said tubular element and said main section of said sleeve element, said first portion of said body being deflected in shear by movement of said members toward each other;

said elastomer body including a second annular portion overlying said flange of said sleeve element and projecting therefrom towards said other of said members, said second portion of said body being disposed in encircling spaced

relationship to said portion of said rigid tubular element projecting from said opening; said second portion of said body being deflected in compression and bulged both radially inward and radially outward by movement of said members toward each other.

4,530,492

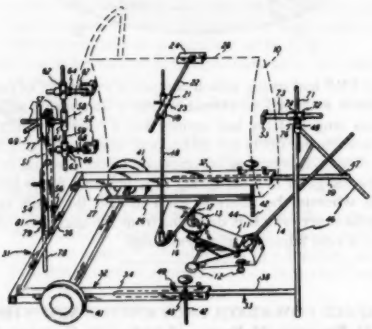
APPARATUS FOR SUPPORTING VEHICLE BODY PARTS

Robert L. Bork, 27408 Church Rd., Burlington, Wis. 53105

Filed May 25, 1983, Ser. No. 498,074

Int. Cl.³ B66F 5/04

U.S. Cl. 269—17 **10 Claims**



1. Apparatus for supporting a vehicle door, comprising a horizontally disposed floor-supported frame including two pieces which are releasably attached together to present opposite ends of said frame and defining an endlessly vertically extended clear central space from the floor upward, one of said two pieces having floor supports thereon at opposite ends thereof for horizontal free-standing positioning of said one piece on the floor when detached from the other of said two pieces, a wheel-supported holder for mobily supporting said door, said one piece being open at one end thereof when detached from the other of said two pieces for receiving said door moved horizontally into the confines of said one piece by said wheel-supported holder, each of said two pieces including a standard extending uprightly thereon at said opposite ends, and connector means on each of the two of said standards and extending to said clear central space for attaching to said door.

4,530,493

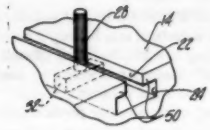
MACHINE TABLE FASTENER ASSEMBLY

Douglas G. Break, Independence Green Apts, 24654 Madison Ct., Apt. 241, Farmington Hills, Mich. 48024

Filed Jul. 30, 1984, Ser. No. 635,564

Int. Cl.³ B23Q 3/02

U.S. Cl. 269—93 **4 Claims**



1. For use in conjunction with a machine table having a work supporting surface, at least one elongated first slot formed in said table and open to said surface, said first slot being open to an elongated second slot formed in said table beneath said surface, said second slot having a width greater than said first slot, a fastener assembly comprising:

an elongated stud threaded at one end,

a cross member secured transversely across the other end of said stud said cross member having two spaced apart and parallel sides with a width between said sides less than the width of said first slot and a length greater than the width of said first slot but less than the width of said second slot so that said cross member is insertable through said first slot and rotatable in said second slot to a position transverse to the axis of said second slot, and

means insertable into said slots for preventing rotation of said cross member comprising a U-shaped collar having a base and two legs, said collar having a width less than the width of said first slot and an opening in said base through which said stud is slidably received,

wherein, with said cross member positioned in said second slot and rotated so that the axis of said cross member is transverse to the axis of said second slot and with said collar positioned over said stud, said legs extend downwardly into said second slot so that one leg is positioned along each side of said cross member to thereby lock said cross member against rotation.

4,530,494

AUTO COPY-PAPER SELECTOR

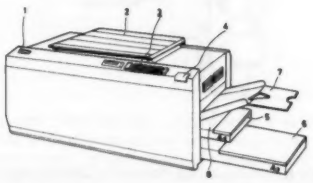
Kiyonobu Saitoh, Nara, Japan, and Katsuyoshi Fujiwara, Osaka, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 11, 1983, Ser. No. 483,532

Claims priority, application Japan, Apr. 15, 1982, 57-63261; Apr. 15, 1982, 57-63262

Int. Cl.³ B65H 3/44

U.S. Cl. 271—9 **4 Claims**



1. An automatic paper selector suitable for a copying machine comprising:

first and second paper supply sections to which first and second cassettes storing papers are attached, respectively;

first and second paper extracting means for extracting the papers from the first and second cassettes, respectively, the first and second paper extracting means being positioned at the first and second paper supply sections, respectively; and

automatic selecting means for operating said automatic paper selector comprising first and second sensor means for detecting the attachment of said first and second cassette, respectively, first and second differential circuit means responsive to said respective first and second sensor means and connected respectively to a set and a reset input terminal fo a flip-flop means, said flip-flop means being responsive to said first and second differential circuit means for generating set and reset output signals for activating first and second selection lamps, respectively via a first switching circuit means, means for providing said set and reset output signals to a second switching means, said second switching means being responsive to said output signals and to further signals from a CPU for activating either said first or said second paper extracting means associated with the detected first or second cassette.

4,530,495
PICK-UP UNIT IN A SHEET-TRANSPORTING DEVICE OF A PRINTING MACHINE

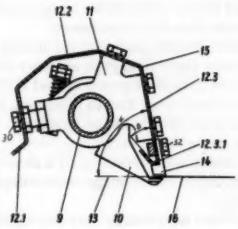
Hans Zimmermann, Coswig; Fritz Pieper, Radebeul, and Hartmut Nagel, Coswig, all of German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Nov. 18, 1983, Ser. No. 553,474

Claims priority, application German Democratic Rep., Dec. 1, 1982, 245409

Int. Cl.³ B65H *29/04*

U.S. Cl. 271—204 **4 Claims**



1. In a sheet transport device of a printing machine, wherein transported sheets are moved along a path defined by a sheet-transport means by a plurality of pick-up units for gripping the sheet and transporting it along said path from a last printing station to a sheet stack, the pick-up unit comprising a gripper shaft; a plurality of grippers connected to said gripper shaft and a plurality of counter gripping elements cooperating with the respective grippers for engaging the sheet being transported; and a traverse carrying said counter gripping elements and enclosing the pick-up unit at three sides thereof, said traverse including a front wall portion, an upper wall portion and a rear wall portion merging one into another, said rear wall portion extending to a plane of transporting of the sheets at an angle α which is smaller than 90°, said rear wall portion carrying said counter gripping elements and being provided with an inclined projection extended inwardly of said rear wall portion.

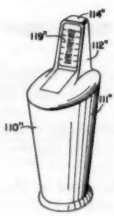
4,530,496
DEVICE FOR EXERCISE AND/OR THERAPY

Leonard E. Smith, West Carrollton, and James Johnson, Kettering, both of Ohio, assignors to IMNETEC Inc., Dayton, Ohio

Filed Jan. 27, 1983, Ser. No. 461,535

Int. Cl.³ A63B *21/30*

U.S. Cl. 272—68 **6 Claims**



1. A device for exercise and/or therapy of individuals, comprising in combination: a unitary hollow primary body of pliable material having a shape made impervious to air by a rotocasting method and including a gas reservoir portion integral therewith and enclosed therein as a sealed system, a liquid at least partially filling said primary body itself so that pressure and compressive force applied directly to said primary body with equalized pressure of shape thereof is transmitted to said liquid to displace and compress the liquid against said gas reservoir portion that is entrapped therein to provide increasing resistance as the device is compressed in the sealed system as more and more pressure must be applied to cause incremental changes in liquid displacement; said primary body including an upper L-shaped integral stem portion that is heat sealed tightly at an upper end thereof; said primary body including an outwardly projecting thickened portion located peripherally along a base thereof; said L-shaped integral stem portion being located on a dome-shaped configuration of said primary body; said L-shaped integral stem portion having a flattened angular surface in a console-like arrangement along an index-finger-like configuration protruding upwardly from said primary body; and pressure indicator markings as gradations for liquid-level-displacement in an actual reading of values that appear directly on a vertical portion of the angular flattened surface of upwardly protruding console-like arrangement unitary therewith to set forth the incremental changes in liquid displacement relative thereto from said unitary hollow primary body of pliable material anatomically more correct so as to equalize pressure over the shape of the hand.

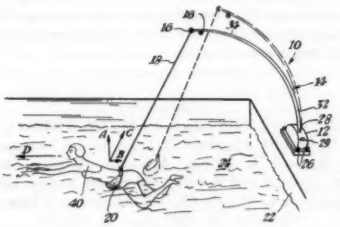
4,530,497
EXERCISING DEVICE

William Moran, and Donald E. Bellerive, both of 8940 A, SW. 20 Pl., Fort Lauderdale, Fla. 33324

Filed Apr. 21, 1983, Ser. No. 487,271

Int. Cl.³ A63B *31/00*

U.S. Cl. 272—71 **4 Claims**



1. An exercising device for a swimmer to allow generally free movement of legs and arms while providing an upward force approximating the planing force of a free swimmer and providing a reaction force to hold the swimmer in one area of the body of water, comprising:

a base;

said base including a plurality of holding conduits,

a variable force means comprising a flexible pole for providing a reaction force means and an upward force means, said variable force means connected to one of said holding conduits in said base;

connecting means connected to said variable force means and connectable to a swimmer;

said reaction means for providing a variable reaction force that allows movement of the swimmer in one area of the body of water away from said base in relationship to the swimming force of the swimmer; and

said upward force means for providing an upward force to the swimmer for simulating a planing force of a free swimmer;

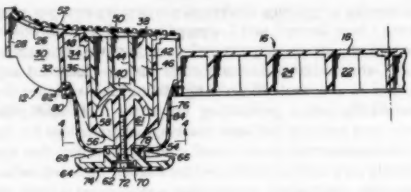
said upward force means increasing as said reaction force increases and as the swimmer's swimming force increases.

4,530,498

AMUSEMENT AND/OR EXERCISING DEVICE

Richard L. Heatwole, 1516 Ardmore, Fort Wayne, Ind. 46804

Filed Sep. 29, 1982, Ser. No. 426,350
Int. Cl.³ A63B *23/04*
U.S. Cl. 272—146 **8 Claims**



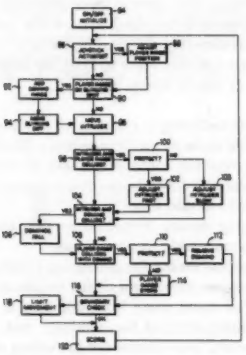
1. An amusement and/or exercising device comprising first and second pads spaced from each other, each pad being adapted to support one leg of a person, means integral with the pads and having a ribbed cross section which resists twisting and rigidly interconnecting said pads, a discrete ground engaging element below and associated with each pad, each pad having a hollow means defining at its lower end a bearing socket approximately three-quarters of a sphere, each hollow means including concentric walls extending upwardly from its associated socket with one of the concentric walls being supported by a shoulder on the outer concentric wall of its associated pad, said socket being partially defined by the lower end of said outer concentric wall, a generally spherical bearing in each socket, means releasably connecting each bearing in a rigid manner to one of said ground engaging elements, each pad being pivotable relative to its associated bearing through a limited arc to thereby facilitate tilting the pads as a unit with one pad being higher than the other and off the ground, and removable means for permitting each pad to rotate through a limited arc relative to its associated ground engaging element only in a lengthwise direction of said device.

4,530,499

DOMINO, OR THE LIKE, PLACING VIDEO GAME

Jeffrey D. Breslow, Highland Park; Howard J. Morrison, Deerfield; Richard A. Ditton, Arlington Heights; Steven M. Meyer, Chicago, and Robert S. Morrison, Vernon Hills, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Sep. 30, 1982, Ser. No. 430,558
Int. Cl.³ A63F *9/20, 9/22*
U.S. Cl. 273—1 GC **33 Claims**



1. A method of generating a video game display and controlling the play of a game on a video display in response to the operation of player controls, the method comprising the steps of:

generating video display data transformable by said display into video display images including a playing field image, a player controllable image, a machine controllable image and playing piece images;

adjusting said video display data in response to manual operation of said player controls to vary the location of said player controllable image on said video display;

monitoring said video data to detect data corresponding to the location of said player controllable image;

generating data for placement of playing piece images at predetermined intervals in an array;

comparing said player controllable image location data with said placement data for coincidence;

generating video display data corresponding to the placement of playing piece images in an array coincident with said placement data in response to said coincidence;

adapting said video display data to produce a video image of said machine controllable image moving to interface with said playing piece image array;

detecting a collision corresponding to a close association of said machine controllable image with said player controllable image;

terminating, at least temporarily, any attempted interference by said machine controllable image with said playing piece image array, in response to the detection of the collision;

generating data corresponding to a machine selected pattern of playing piece image positions on said display; and

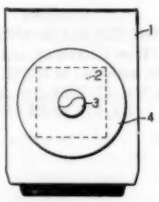
automatically producing data corresponding to a video indication of the next position in said pattern to be occupied by one of said playing piece images including producing data corresponding to a video marker located adjacent to the position to be occupied.

4,530,500

GOLF BALL POSITION MARKER AND STORAGE DEVICE

Joseph Kaymen, 938 Hemlock St., Deerfield, Ill. 60015

Filed Jun. 28, 1984, Ser. No. 622,959
Int. Cl.³ A63B *57/00*
U.S. Cl. 273—32 A **1 Claim**



1. A device for storing, removing and replacing a coin-sized marker to mark the position of a golf ball resting on a putting green, comprising;

a clip formed of metal or plastic shaped to have a spring-like quality which is worn over the waistband or belt of slacks or skirt;

a magnet affixed to the front of the clip and whose size, shape and strength relative to the marker is critical to the easy removal, replacement and safe storage of a marker;

a rounded knob which projects from the face of the magnet and when mated with a hole in a marker prevents lateral dislodgment of the marker, the shape and size of the knob in relation to the marker being instrumental along with the magnet in reducing the chance of frontal accidental dislodgment of the marker to a remote and acceptable possibility; and

a marker having a center hole with a diameter which closely matches the diameter of the knob and mates with it and

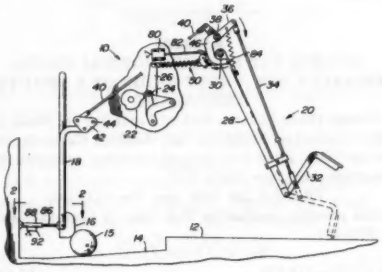
whose two faces are suitably prepared to accept printing for advertising or marking pen for identity purposes.

4,530,501

CONVERSION APPARATUS FOR BOWLING PIN SETTING MACHINE

Ernest E. Paster, Green Lane, Pa., and David Paster, Williamstown, N.J., assignors to Eastern Bowling Equipment Company, Philadelphia, Pa.

Filed Jul. 1, 1983, Ser. No. 510,018
Int. Cl.³ A63D *5/00*
U.S. Cl. 273—43 R **3 Claims**



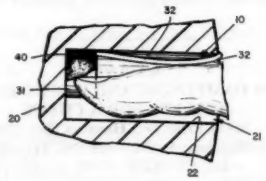
1. A kit for converting a known type of automatic bowling pin setting apparatus for decreasing the cycle time thereof comprising electronic circuitry which includes an electrical switch adapted to be responsive to contact between a bowling ball and a pit cushion, said circuitry including a solenoid for initiating release of a latch so that at least a portion of a rake may descend immediately upon contact of the ball with the cushion and permit recycling of the ball, an adjustable timer for association with a relay forming a part of the machine control, and telescoping members one of which is adapted to be pivotably coupled to said pit cushion, one of said members supporting said electrical switch which is actuable by the telescoping movement of said members.

4,530,502

BOWLING BALL INCLUDING THUMB-HOLE INSERT

Jimmie F. Yamane, 7805 Goll Ave., North Hollywood, Calif. 91605

Filed Feb. 17, 1984, Ser. No. 581,335
Int. Cl.³ A63B *37/00*
U.S. Cl. 273—63 A **1 Claim**



1. A thumb insert in combination with a bowling ball having a thumb-hole having an internal cylindrical sidewall and which is disposed in and fixedly coupled to the internal cylindrical sidewall of the thumb-hole, said thumb insert comprising an integral member which is formed from a flexible material and which has:

a. a substantially semi-cylindrical base which is fixedly coupled to the internal cylindrical sidewall of the thumb-hole of the bowling ball adjacent to the bottom portion thereof; and

b. a sightly curved member against which the bowler places the back of his thumb so that the front of his thumb contacts the internal cylindrical sidewall of the thumb-hole of the bowling ball, said slightly curved member being resiliently coupled to said substantially semi-cylindrical base and spaced from the sidewall of said thumb-hole so that the back of the bowler's thumb compresses said curved member against the sidewall of said thumb-hole on inserting said thumb into the thumb-hole of the bowling ball and while gripping the sidewall of said thumb-hole with the front of said thumb.

4,530,503

LOTTERY SELECTORS

Richard R. Rice, Hamilton, Canada, assignor to Larry Richard Rice, Hamilton, Canada

Filed Mar. 14, 1983, Ser. No. 474,809
Int. Cl.³ A63F *7/04, 3/06;* **G07C** *15/00*
U.S. Cl. 273—144 B **3 Claims**

1. A selector arrangement for selection of lottery numbers, and the like, said selector arrangement comprising a stand having a hollow upright portion and a selector member detachable from said stand, said selector member comprising a mixing region for intermixing a plurality of indicia bearing members within said selector member and a selector region into which the indicia bearing members are freely and randomly moveable from said mixing region and which is sized for ordered stacking of the indicia bearing members in the selector region; said selector region being transparent for viewing of such ordered stacking to provide the selection and having a first end which is opened to said mixing region for gravity feeding the indicia bearing members to said selector region and a second closed end remote from said mixing region and sleeve means at said second end of said selector region for sleeving over said hollow upright portion of said stand in a first support mode for said selector member and for sleeving onto one end of a writing tool the other end of which is located within said hollow upright portion of said stand in a second support mode for said selector member.

4,530,504

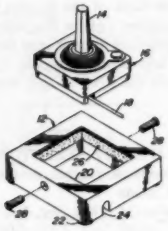
STABILIZER FOR MANUAL VIDEO GAME CONTROLLER

Charles A. Long, Jr., c/o 801 Fifth Ave. North, Birmingham, Ala. 35203

Filed May 19, 1983, Ser. No. 496,144
Int. Cl.³ A63F *9/22;* **A47G** *29/00*
U.S. Cl. 273—148 B **1 Claim**

1. Apparatus comprising a manually operable video game controller including a body, an upstanding joy stick, a weighted stabilizer circumscribing the outer periphery of said controller body and non-rotatably supporting said controller body, the transverse dimensions of said stabilizer being substantially greater than the height of said stabilizer, the stabilizer comprising a shell member, filler material which is inserted into the shell member to add weight to the stabilizer and a base

member for containing the filler material within the shell member, the base member including at least one fill hole extending therethrough, a flowable hardenable glue material being inserted into the fill hole after the insertion of the filler material to compensate for any shrinkage of the filler material, to secure the filler material to the base member and to plug the fill hole,



a support member being affixed to the bottom of the base member by the glue material to cover at least the fill hole and to support the apparatus and prevent damage to a supporting surface, means on said stabilizer for releasably securing said stabilizer to the outer periphery of said controller body, and an electrical conductor having one end electrically coupled to said controller body.

4,530,505

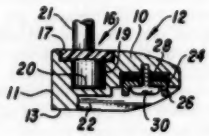
GOLF CLUB HEAD

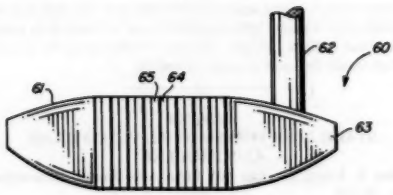
Alfred O. Stuff, 1176C Paseo Del Mar, Casselberry, Fla. 32707

Continuation-in-part of Ser. No. 393,643, Jun. 30, 1982, Pat. No. 4,423,874, which is a division of Ser. No. 231,981, Feb. 6, 1981, Pat. No. 4,340,229. This application Nov. 9, 1982, Ser. No. 440,272

Int. Cl.³ A63B *53/08*

U.S. Cl. 273—164 **1 Claim**





1. A golf club head comprising:

a golf club head body having a front ball striking face thereon;

a plurality of recessed slots in said face, each slot being between 1/32 and ¼ inch wide and of a depth to prevent the bottom of the slot from contacting a golf ball upon impact with said striking face, each slot extending substantially vertical across the center of said striking face, thereby reducing the contact area engaging a golf ball, said golf club head body having a horizontal plane normal to the striking face thereof;

sighting means disposed in a top surface of said golf club head for visually determining when said horizontal plane is parallel with the putting surface, said sighting means having an index adjacent the ball striking face; and

said body having a sole plate extending rearwardly from the striking face and at least three relieved areas in said sole portion disposed rearwardly from said front striking face and extending to said rear edge, said relieved area defining at least two ribs forming the rearwardly extending portion of said sole plate, thereby minimizing the area of the sole plate which will be in contact with the surface during a stroke.

4,530,506

SEALING CAP FOR CYLINDRICAL PARTS, ESPECIALLY FOR A BOLT GUIDE OF A SPOT-TYPE DISK BRAKE

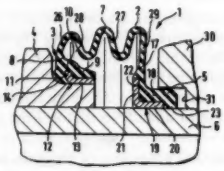
Rolf Weiler; Horst Kretzer, both of Frankfurt am Main; Hans-Dieter Leidecker, Eschborn, and Winfried Gerhardt, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jul. 20, 1984, Ser. No. 632,818

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1983, 3326482

Int. Cl.³ F16S *15/52*

U.S. Cl. 277—212 FB **12 Claims**



1. A sealing cap for cylindrical parts, such as a bolt guide of a spot-type disk brake, comprising a continuous resilient boot, one end portion of the boot being adapted to be secured circumferentially to a first cylindrical part of a first diameter and the other end portion of which is adapted to be secured circumferentially to a second cylindrical part of a second diameter different than said first diameter with both cylindrical parts aligned on the same axis, and comprising rigid insert members, one insert member in each of said end portions, wherein both insert members with at least a part of their radial extensions are disposed the same radial distance from the axis of the cylindrical parts such that, upon axial movement of said end portions toward each other, said rigid insert members will abut each other.

4,530,507

VIBRATION DAMPENING AND WORKPIECE GUIDING ROLLERS FOR A CHUCK

Roy Lee, Jr., 10134 Briar Dr., Houston, Tex. 77042

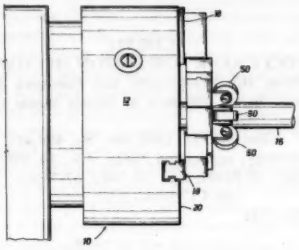
Filed Aug. 1, 1983, Ser. No. 519,241

Int. Cl.³ B23B *31/10, 31/16*

U.S. Cl. 279—1 Q **6 Claims**

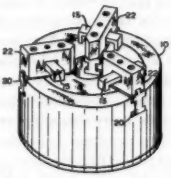
1. A chuck for holding a workpiece during a machining operation comprising a body having an opening therein through which a workpiece can extend, a plurality of jaws supported by the body for engaging a workpiece at spaced points on the circumference of the workpiece to hold the work piece from rotation relative to the chuck, means for moving the jaws into and out of engagement with a workpiece, a plurality of vibration dampening members of elastomeric material, and means mounting the members on the jaws for movement therewith and to engage the workpiece before the jaws

when the jaws are moved into engagement with the workpiece and to be compressed against the workpiece to absorb and



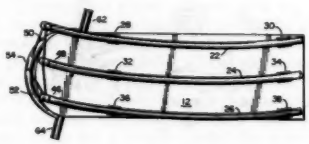
dampen vibrations in the workpiece from machining operations thereon.

4,530,508
JAW LOCKING MEANS FOR LATHE CHUCKS
Thomas A. Ferraro, 1582 Leon Dr., Hatfield, Pa. 19440
Filed Jul. 14, 1982, Ser. No. 398,106
Int. Cl.³ B23B *31/10*
U.S. Cl. 279—123 **8 Claims**



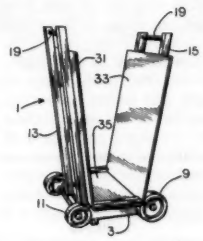
1. A jaw for use in a lathe chuck having a face and means for carrying the jaw relative to said face, said jaw having a transverse passageway and a ceiling which lies substantially parallel to the chuck face, an inverted U-block located in said passageway with its legs outside the jaw, and screw means associated with said jaw for urging the top of the U-block away from the ceiling of said passageway so that said legs can be brought to bear on the face of the chuck body thereby locking the jaw against movement.

4,530,509
SLED
Joseph A. Maxwell, Jr., 1000 Phillips Knob, Burnsville, N.C. 28714
Filed Aug. 8, 1983, Ser. No. 520,943
Int. Cl.³ B62B *13/10*
U.S. Cl. 280—22 **2 Claims**



1. A sled comprising
(a) a generally planar platform having an upturned front portion;
(b) tubular runners attached to the platform at fore and aft pivot points, said runners having upturned front portions which extend beyond the fore pivot points, said runners being attached at the fore and aft pivot points by generally U-shaped clip means which are pivotally and slidably mounted to the platform and which partially encircle the tubular runners for providing lateral support, said clip means having a tongue which passes through an opening formed in the runner, said tongue being held in engagement with the opening in the runner by spring means, wherein said runner is connected to said clip means and can be removed from the clip means by flexing the spring means sufficiently to disengage the tongue from the opening; and
(c) steering means attached to the front portion of each runner for laterally displacing the runners while maintaining them in a parallel relationship, wherein said runners bow by pivoting and sliding longitudinally with respect to the platform at the fore and aft pivot points while the sled is being steered.

4,530,510
LOG ROLLER
Robert H. Driggers, 105 Beth Dr., Greenville, S.C. 29606
Filed Nov. 10, 1983, Ser. No. 550,891
Int. Cl.³ B62B *3/00*
U.S. Cl. 280—47.17 **4 Claims**



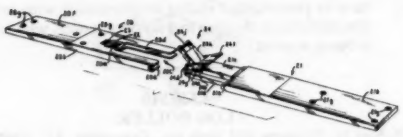
1. An apparatus for transporting firewood from the exterior of a dwelling to the interior thereof, comprising:
a platform having a proximal end and a distal end;
a pair of wheels at the proximal end of said platform;
a pair of wheels at the distal end of said platform, said pair at the distal end being of greater diameter than said pair at the proximal end;
a proximal retaining member extending generally vertically upward from said platform from the proximal end thereof;
a distal retaining member extending generally vertically upward from said platform from the distal end thereof;
handle means at the upper extremity of each retaining member, whereby said apparatus may be tilted and rolled on either of said pair of wheels utilizing the handle means at the same end thereof for so doing.

4,530,511
SEPARABLE SKI
Walter A. Brandt, III, 2101 Redwood Ave., Emporia, Kans. 66801
Filed Oct. 24, 1983, Ser. No. 544,685
Int. Cl.³ A63C *5/02*
U.S. Cl. 280—603 **9 Claims**

1. A separable ski laterally divided intermediate the ends thereof, said ski comprising:
first and second ski portions positionable in longitudinal, end butting fashion, each said ski portion having an upper surface and a lower, skiing surface;
first and second ski boot binders mounted respectively on the upper surface of said first and second ski portions;
a female connector substantially embedded within said first ski portion, said first ski portion including a lower snow engaging surface extending beneath said female connec-

tor, said female connector including an open, substantially U-shaped socket having forwardly projecting arms with interior sidewalls and having a continuous grooved channel in said sidewalls;

a male connector substantially embedded within said second ski portion, said second ski portion including a lower snow engaging surface extending beneath said male connector, said male connector having a substantially U-shaped tongue projection extended longitudinally therefrom and configured to matingly engage said female connector when said ski portions are positioned in end abutting fashion, said tongue projection of said male connector including an outwardly projecting continuous ridge



thereon received within said continuous grooved channel in said sidewalls of said female connector when said ski portions are positioned in end abutting fashion;

latch hook means secured to said female connector and recessed below the upper surface of said first ski portion; and

toggle lock means secured to said male connector to lockingly engage said latch hook means when said male connector engages said female connector, said toggle lock means recessed below the upper surface of said second ski portion when lockingly engaged with said latch hook means and positioned to lie between said first and second ski boot binders.

4,530,512

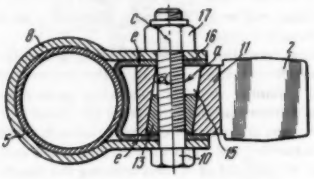
SUSPENSION OF A MOTOR VEHICLE

Viktor I. Evlanov, Moscow, U.S.S.R., assignor to Avtomobilny Zavod Imeni Leninskogo Komsomola, Moscow, U.S.S.R.

Filed Aug. 15, 1983, Ser. No. 523,634

Int. Cl.³ B62D *17/00*

U.S. Cl. 280—661 **2 Claims**



1. Suspension of a motor vehicle comprising: a steering knuckle connected to a wheel of the motor vehicle; a suspension guiding means having links connecting said steering knuckle to the body of said motor vehicle; bolts connecting one of said links to said steering knuckle; bores in said steering knuckle for the passage of said bolts therethrough; a mechanism for adjusting camber of said wheels in the form of a nut-screw kinematic pair secured on one of said bolts with the screw defined by a thread on a portion of one of said bolts passing through one of said bores of said steering knuckle and the nut mounted on said screw for translational motion during adjusting wheel camber, the nut having parallel outer surfaces arranged at an angle to the axis of its threaded hole; one of said holes in said steering knuckle being arranged at an angle to a perpendicular passed through its bearing surfaces for one of said bolts, this angle corresponding to the inclination angle of the parallel outer surfaces of said nut to its axis, this bore in said steering knuckle having in cross-section configuration and dimensions corresponding to the shape and dimensions of said nut.

4,530,513

VEHICLE REAR SUSPENSION MECHANISM

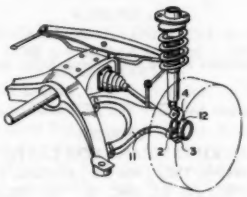
Takao Kijima; Jiro Maebayashi, and Fumitaka Ando, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 28, 1983, Ser. No. 489,492

Claims priority, application Japan, Apr. 30, 1982, 57-73991; Apr. 30, 1982, 57-73992; Apr. 30, 1982, 57-73993

Int. Cl.³ B60G *3/26, 7/00*

U.S. Cl. 280—701 **12 Claims**



1. A vehicle rear suspension mechanism comprising a body side support member a part of which is connected to the vehicle body, wheel hubs for supporting the rear wheels for rotation, a ball joint connecting each wheel hub to the body side support member so as to permit pivotal movement of the wheel hub about a point relative to the body side support member, and first and second resilient bushings which resiliently connect the wheel hub to the body side support member, said ball joint being positioned in quadrant I, as viewed from the left side of the vehicle body, said first resilient bushing being positioned in quadrant II, and said second resilient bushing being positioned in quadrant IV on a coordinate plane having its origin on the center of the rear wheel, and its abscissa and ordinate on the horizontal line passing through the center of the rear wheel and the vertical line passing through the center of the rear wheel, respectively.

4,530,514

TOE-OUT CHANGE PREVENTIVE SWING-ARM VEHICLE SUSPENSION

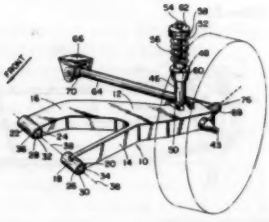
Hideo Ito, Zushi, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 14, 1983, Ser. No. 485,022

Claims priority, application Japan, Apr. 26, 1982, 57-69763

Int. Cl.³ B60G *3/26, 7/02*

U.S. Cl. 280—701 **19 Claims**



1. A leading or trailing arm vehicle suspension for a wheeled vehicle comprising:

a suspension arm having a pair of connecting portions;

wheel means for rotatably mounting a road wheel oriented

in a desired rolling direction on one end of said suspension arm;

pivot means for pivotably securing the other end of said suspension arm to a vehicle body cross member through said connecting portions, one of said connecting portions being spaced inwardly relative to the other connecting portion, said pivot means permitting vertical pivoting movement of said suspension arm and wheel means about a pivot axis and resiliently permitting lateral yawing movement of said suspension arm and wheel means and rotational movement of said suspension arm and wheel means about a camber axis;

said suspension arm having a theoretical camber axis extending along a line through said one end of said suspension arm and through a midpoint between said connecting portions of said pivot means, said theoretical axis forming an angle with respect to the desired rolling direction of said road wheel;

a shock absorber means disposed between said suspension arm and said vehicle body for creating a shock absorbing force against relative movement in an essentially vertical direction between said suspension arm and said vehicle body;

means for connecting said suspension arm to said vehicle body for preventing lateral yawing movement of said suspension arm and wheel means; and

means associated with said suspension arm for establishing an actual camber axis for said suspension arm, said actual camber axis crossing said pivot axis of said pivot means at a position outwardly shifted from the midpoint between said connecting portions;

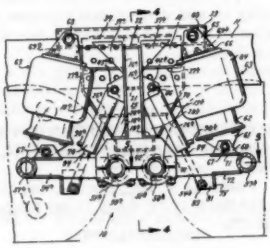
whereby the tendency for toe-out change of the orientation of the road wheel to take place when rotational movement of the suspension arm and camber change of said road wheel occur is reduced.

4,530,515

DUAL STUB AXLE AIR SPRING SUSPENSION WITH HIGH-AXLE HYDRAULIC LIFT

John E. Raidel, Rte. 1, Box 400-N, Springfield, Mo. 65804

Filed Nov. 9, 1983, Ser. No. 549,894
Int. Cl.³ B60G 11/12
U.S. Cl. 280—704 **10 Claims**



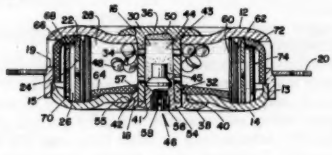
1. In an apparatus for lifting axles on vehicles: a pedestal adapted to be attached to the frame of the vehicle, the pedestal having a portion attachable to the frame, and a vertically extending portion disposed at one side of the frame, a pair of oppositely extending bolster beams rockably attached to the lower part of the pedestal to one side of the frame, one extending forward and one extending aft, each being adapted to receive axle means for a vehicle wheel; the pedestal having securely thereon at the upper part of the vertically extending portion, fore and aft upper extending support means spaced to one side of the frame and above and overlying the bolster beams; a pair of spring means one connected between each bolster beam and the support means above it, arranged at one side of the frame, to cushion the rocking movements of the bolster beams; motors, one for each bolster beam, connected between such bolster beam and the pedestal and actuatable to produce lifting and lowering of the bolster beam.

4,530,516

ALUMINUM INFLATOR WITH STEEL CENTER-TIE

Gary V. Adams, Perry; Scott R. Anderson, Tremonton, and Donald R. Lauritzen, Hyrum, all of Utah, assignors to Morton Thiokol Inc., Chicago, Ill.

Filed Jul. 9, 1984, Ser. No. 629,023
Int. Cl.³ B60R 21/08
U.S. Cl. 280—741 **8 Claims**



1. A housing construction for inflators using solid fuel for the generation of gas to inflate vehicle inflatable cushion restraint systems and including ignition means for igniting the solid fuel comprising:

first and second structural components comprising a diffuser means and a base means,

said diffuser means comprising a first cylindrical aluminum shell having a first axis, said shell having a plurality of circumferentially spaced diffuser ports and a first central opening on the first axis,

said base means comprising a second cylindrical aluminum shell having second axis, said second shell being sized to mate with said first shell to form an enclosure for containing the inflator solid fuel and having a second central opening on the second axis,

said base means being attached to said diffuser means with the first axis of said diffuser means in alignment with the second axis of said base means and with the first and second central openings in axial alignment,

an initiator housing assembly for effecting ignition of the inflator solid fuel,

elongated cylindrical center-tie retaining means extending through the first and second central openings, said center-tie retaining means being made of steel and characterized in retaining its strength at elevated temperatures in a range at which the aluminum of which said first and second shells is made tends to degrade, said retaining means having an integrally formed cap means at a first end for tight engagement with said first aluminum shell at a region thereof adjacent the first central opening, said retaining means being hollow with perforated walls and having an opening at a second end, said initiator housing assembly being inserted in the opening at the second end of said retaining means, and

attaching means for rigidly attaching the second end of said retaining means to said second aluminum shell and for retaining said initiator housing assembly within said steel retaining means.

4,530,517

INSTRUMENT PANEL STRUCTURE OF AUTOMOTIVE VEHICLE

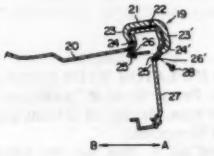
Yoshiyuki Miyabayashi, Tokyo; Hiroshi Koyachi, Sagamihara, and Yukihiro Kurosawa, Omiya, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 15, 1982, Ser. No. 434,624

Claims priority, application Japan, Oct. 23, 1981, 56-169642

Int. Cl.³ B60R *21/02;* **B62D** *25/14;* **B60N** *3/02*

U.S. Cl. 280—752 **1 Claim**



1. An instrument panel structure of an automotive vehicle comprising:

an upper panel member having a rearmost marginal portion extending laterally of the vehicle; and

a protective pad assembly detachably secured to said rearmost marginal portion of the panel member,

wherein said protective pad assembly is in its entirety elongated along said rearmost marginal portion of the panel member substantially in ridge form and has a generally inverted U-shaped cross section protruding upwardly from said rearmost marginal portion of said panel member forming between the upper surface of said marginal portion and the inner surface of the pad assembly a cavity which is elongated throughout the length of the pad assembly, the pad assembly being exposed upwardly on the rearmost marginal portion of the panel member to enable a front seat occupant to grasp the pad assembly by hand while being seated on a front seat of the vehicle,

said protective pad assembly comprising a hollow elongated pad member formed of a resilient material and having a generally inverted U-shaped cross section, and an elongated inner reinforcement member which has a generally inverted U-shaped cross section substantially similar to the cross section of said pad member and which is at least partially embedded in the pad member,

said pad member having downwardly directed front and rear longitudinal edge portions spaced apart in a fore-and-aft direction of the instrument panel structure, the front longitudinal edge portion downwardly protruding toward and terminating at the upper surface of the rearmost marginal portion of said upper panel member, and said inner reinforcement member extending between the vicinity of one longitudinal end and the vicinity of the other longitudinal end of the pad member and having front and rear longitudinal edge portions which are embedded in the longitudinal edge portions, respectively, of the pad member,

said inner reinforcement member further having a first series of front tag portions which are bent in fore-and-aft directions of the instrument panel structure and which project outwardly from the lower end of the front longitudinal edge portion of the inner reinforcement member and a second series of rear tag portions which project downwardly from the lower end of the rear longitudinal edge portion of the pad member, the instrument panel structure further having a rear panel member and being formed with a series of front slots formed in the rearmost marginal portion of the upper panel member thereof and a series of rear slots formed in an uppermost marginal portion of said rear panel member, the protective pad assembly being detachably secured to the instrument panel structure with the front tag portions of the inner reinforcement member fitted respectively to the rearmost marginal portion of said upper panel member through said series of front slots and with the rear tag portions securely attached to said rear panel member by releasable fastening means through said series of rear slots, respectively.

4,530,518

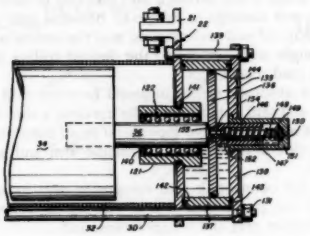
VEHICLE STABILIZER

Alan R. Newton, 67 Bluebird Ave., East Wareham, Mass. 02538

Filed Jan. 18, 1982, Ser. No. 340,308

Int. Cl.³ B62D *37/04*

U.S. Cl. 280—758 **19 Claims**



1. A vehicle stabilizer comprising:

a frame means adapted to be secured to the vehicle,

a relatively weighty mass disposed in the frame means,

means for supporting said mass for axial bidirectional translation in the frame means between opposite ends of the frame means,

said frame means having means defining a compression chamber at each end of the frame means,

a pair of pistons, one associated with each compression chamber,

means supporting each piston independent of said mass but disposed in a position for sliding motion in response to translation of said mass in a first direction to cause compression of fluid in said compression chamber,

and a pair of means associated respectively with said pair of pistons, one at each end of the frame means, for enabling recharging of said compression chamber in response to translation of said mass in a second direction opposite to said first direction.

4,530,519

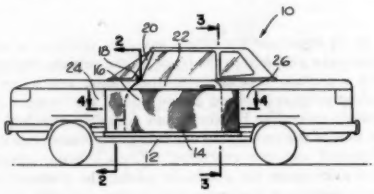
VEHICLE CAR DOOR PROTECTION SYSTEM

Donald J. Marshall, 8440 Sunset Blvd., #314, Los Angeles, Calif. 90069

Filed Aug. 9, 1982, Ser. No. 406,736

Int. Cl.³ B60R *19/00;* **B60J** *11/00;* **B61D** *36/00*

U.S. Cl. 280—770 **4 Claims**



1. An apparatus for protecting the side of a vehicle comprising:

a sheet-like shield having a front and rear projection affixed thereto;

a spindle located in the rocker panel of said vehicle for

rolling and unrolling said shield, said shield having an end fixed to said spindle;

an elongated housing covering said spindle, said housing having an elongated opening which permits said shield to pass therethrough;

a bidirectional motor located in said rocker panel for turning said spindle; and

a front and rear track, wherein said front projection is captive within and movable along said front track and said rear projection is captive within and movable along said rear track, said front track being affixed to and extending along the front door jamb of said vehicle, one end of said front track being located in close proximity to said spindle for receiving said front projection and wherein said rear track is affixed to and extends along the rear door jamb, wherein one end of said rear track is located in close proximity to said spindle for receiving said rear projection, said front projection being movable between the gap formed between the front fender panel and the door panel of said vehicle and said rear projection being movable between the gap formed between the rear fender panel and the door panel of said vehicle, said shield having sufficient rigidity to move said projections along said tracks when said shield is rolled and unrolled from said spindle.

4,530,520

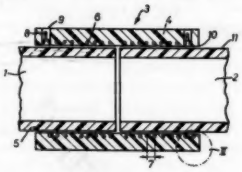
ELECTRICALLY WELDABLE BUSHINGS

Heniz Nyffeler, Recherswil, and Rudolf Buri, Wynigen, both of Switzerland, assignors to Von Roll AG, Gerlafingen, Switzerland

Continuation-in-part of Ser. No. 129,993, Mar. 13, 1980, abandoned. This application Mar. 8, 1984, Ser. No. 587,394

Int. Cl.³ F16L *47/02*

U.S. Cl. 285—21 **6 Claims**



1. An electrically weldable bushing for connecting conduit line elements comprising a body formed of thermoplastic material, having filament wire embedded therein, said filament wire comprising a nickel-iron alloy having a coefficient of thermal expansion of less than 10×10^{-6}/°C.

4,530,521

ELECTRICALLY WELDABLE SOCKET FOR JOINING PIPE MEMBERS

Heinz Nyffeler, Recherswil, and Guido Banholzer, Obergerlafingen, both of Switzerland, assignors to Von Roll AG, Gerlafinger, Switzerland

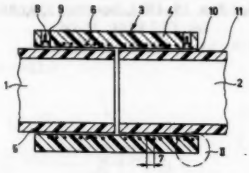
Continuation of Ser. No. 238,449, Feb. 26, 1981, abandoned. This application Mar. 22, 1984, Ser. No. 592,112

Claims priority, application Switzerland, Mar. 4, 1980, 1706/80

Int. Cl.³ F16L *47/02*

U.S. Cl. 285—21 **7 Claims**

1. An electrically weldable socket for connecting conduit elements comprising a cylindrical body formed of thermoplastic material capable of shrinking on being heated, and a helically coiled resistance wire, said wire comprising a plurality of individual thin wire strand elements, said wire strand elements being arranged in said wire to provide gaps between the wire strand elements, said wire being embedded in the wall of said body and extending along the length thereof coaxial with the central axis in proximity to the inner surface of the wall of said body, and having terminal ends extending outward of said body for contact with a source of current, said wire strand



elements when heated expanding relative to each other into the gaps therebetween without overall radial or axial enlargement of said helically coiled wire.

4,530,522

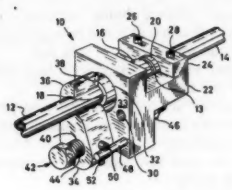
RELEASABLE CONNECTOR FOR CONDUIT COMPONENTS

Kenneth L. Walker, Clinton, and Kenneth A. Farnstrom, Oak Ridge, both of Tenn., assignors to Remote Technology Corp., Oak Ridge, Tenn.

Filed Sep. 6, 1983, Ser. No. 529,582

Int. Cl.³ F16L *35/00*

U.S. Cl. 285—91 **8 Claims**



1. An improved conduit connector of the type utilized to move axially-aligned first and further conduit components into or out of sealing engagement, each of such conduit components having an enlarged ferrule at facing ends thereof, which comprises:

a body member provided with means to securely hold such enlarged ferrule of such first conduit component against axial and rotational movement, said body being provided with a bore to accept such ferrule of such further conduit component in axial alignment with such first conduit component;

a swing clamp pivotally mounted on said body member in an orientation for effecting pivoting in a plane substantially perpendicular to the axis of such aligned first and further conduit components, said swing clamp having a substantially C-shaped extension of a size to substantially conform to the exterior surface of such further conduit component, said swing clamp being provided with a bore substantially parallel with the axis of such aligned first and further conduit components at a center of rotation of said swing clamp, said swing clamp bore being provided internally with left-handed threads;

a pivot bolt provided with exterior left-handed threads to be threadably received within said threaded swing clamp bore, said bolt passing unrestrained through said body member and provided with means to prevent axial movement of said bolt with respect to said body member; and

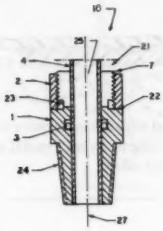
friction producing means associated with said threads of said bolt and said swing clamp.

4,530,523

UNITARY CANTILEVER CLAMP ACTION FITTING WITH A SPLIT END

Oscar Proni, Hollywood, Fla., assignor to Proni Industries, Inc., Miami, Fla.

Filed Jan. 15, 1982, Ser. No. 339,695
Int. Cl.³ F16L *21/06*
U.S. Cl. 285—179 **12 Claims**



1. A cantilever clamp action fitting having a longitudinal axis therethrough and comprising at least one internally threaded nut and a main circumferentially continuous body, said body comprising:

an axial passage extending from end to end of the body,

at least one externally threaded segmented end having slots dividing the end into a plurality of segments,

a transversal surface corresponding to the segmented end extending outwardly to the perimeter of the main body,

said transversal surface being substantially symmetrical about the longitudinal axis and being smaller than or equal to the external dimensions of said nut,

said transversal surface being separated axially from said segmented end and

said transversal surface being generally perpendicular to said longitudinal axis and forming a camming or reactive force surface for said nut;

said threads on said nut and said segments each having tapered side walls,

whereby a reactive force felt by the nut as the nut is tightened against said transversal surface is transmitted, via the internal nut threads reacting on the externally segment threads, to the segments of said segmented ends, and both radial and longitudinal components of the reactive force contribute to bending of the segments and cause each segment to bend inwardly toward the longitudinal axis thereby clamping tightly a workpiece placed in the axial passageway of the fitting.

4,530,524

APPARATUS FOR CLAMPING A HOSE ONTO A COOLANT TUBE

Donald L. Stephens, King County, Wash., assignor to Paccar Inc., Bellevue, Wash.

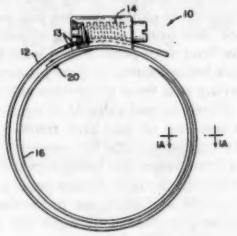
Filed Jul. 29, 1982, Ser. No. 402,930
Int. Cl.³ F16L *55/00*
U.S. Cl. 285—187 **5 Claims**

1. A hose clamp assembly for retaining a resilient elastomeric hose onto a rigid tube connected to a coolant system or the like, comprising:

flexible circumferentially contractible band means;

means for tightening the band means for reducing its circumference, said hose being adapted to be fitted between the band means and the tube; and

means operatively associated with the band means for restraining expansion of the hose axially of the band means and for allowing limited radial expansion of the hose within the axial confines of the band means, said hose expansion restraining means including a plurality of serrations axially spaced along substantially the entire axial width of the band means and extending substantially around the entire circumference of the band means, said serrations each including an opening facing the hose and having spaced gripping edges engaging the hose, said opening of said serrations having widths and depth defining opening volumes larger than the volumes of elastomeric hose within the edges of the serrations engaging the hose at normal room temperatures so that upon elevation



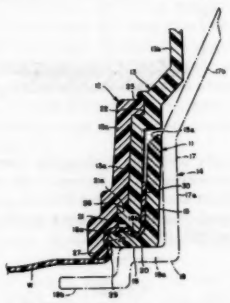
of the temperatures the elastomeric hose can expand radially into the openings rather than be limited only to axial expansion out from the band means, whereby repeated expansion and extraction of the hose will result in residual resiliency remaining in the hose to maintain a tension in said band means and reduce leakage of coolant from between said hose and said tube.

4,530,525

ACCESS PORT FORMING DEVICE AND METHOD

Barry L. Schneider, Deerfield, Ill., assignor to Hollister Incorporated, Libertyville, Ill.

Filed Jan. 17, 1983, Ser. No. 458,313
Int. Cl.³ F16L *5/00*
U.S. Cl. 285—200 **23 Claims**



1. An access port forming device comprising an internal support ring having a tubular side wall and an outwardly-projecting flange at one end thereof; said side wall being adapted to be extended through an opening in a wall of flexible, resilient, thermoplastic material with the wall material engaging said flange and defining an axially-turned collar extending about said ring; a tubular nipple of elastomeric material having a proximal end dimensioned to fit about the side wall of the ring and having a reduced distal end; and an external locking ring adapted to extend about the side wall of said internal support ring to clamp said proximal end of said nipple and said collar therebetween; said external ring including locking means engagable with said flange for anchoring said internal and external rings together with said clamped proximal end of said nipple serving as a gasket between said internal and external rings.

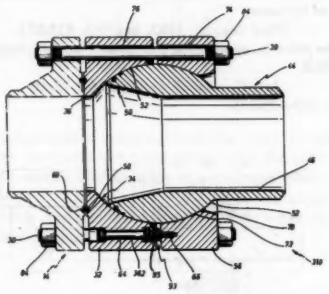
4,530,526
SWIVEL COUPLING ELEMENT

Emil E. Dopyera, and Jack E. Miller, both of Houston, Tex., assignors to Big-Inch Marine Systems, Inc., Houston, Tex.

Division of Ser. No. 271,114, Jun. 8, 1981, , which is a continuation-in-part of Ser. No. 196,527, Oct. 14, 1980, Pat. No. 4,381,871. This application Jul. 21, 1983, Ser. No. 515,765

Int. Cl.³ F16L 27/06

U.S. Cl. 285—261 16 Claims



1. A swivel coupling element for coupling a tubular element to a conventional annular coupling flange which has a generally planar leading end defined by a leading end of an annular flange portion and by a seating face proximate the leading end, the annular flange portion having a plurality of circumferentially spaced stud holes for use in coupling the conventional annular coupling flange to another coupling flange, the swivel coupling element comprising:

(a) an annular mounting flange having a trailing end, having a leading end which defines a seating face for cooperating with the seating face of such a conventional annular coupling flange, and having a segmental spherical surface;

(b) a tubular member having a trailing end for connection to a tubular element, and having a leading end having a segmental spherical surface to cooperate with the segmental spherical surface of the mounting flange;

(c) an annular retainer flange which has a bore through which the trailing end of the tubular member extends, the retainer flange defining a gripping surface for engaging with the leading end of the tubular member;

(d) the annular retainer flange being connected to the annular mounting flange to maintain the swivel coupling element in an assembled condition with the leading end of the tubular member held captive between the segmental spherical surface of the mounting flange and the gripping surface of the retainer flange while permitting the tubular member to swivel relatively to the mounting flange;

(e) spacer means operative between the mounting flange and the retainer flange to maintain them in spaced relationship to facilitate displacement of the tubular member relatively to the mounting flange before the swivel coupling element is coupled to such a conventional annular coupling flange;

(f) the annular retainer flange being adapted to be coupled to such a conventional annular coupling flange to couple the swivel coupling element to such a conventional annular coupling flange, to overcome the action of the spacer means to draw the gripping surface into engagement with the leading end of the tubular member and the leading end of the tubular member into engagement with the segmental spherical surface of the mounting flange to thereby lock the tubular member against relative displacement, and to draw the seating face of the mounting flange into seating association with the seating face of such a conventional annular coupling flange.

4,530,527
CONNECTION OF DRILL TUBES

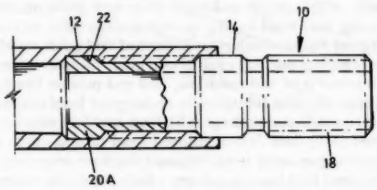
John M. Holmberg, Ascot, England, assignor to Boart International Limited, Johannesburg, South Africa

Filed Sep. 20, 1982, Ser. No. 420,160

Claims priority, application South Africa, Sep. 21, 1981, 81/6533

Int. Cl.³ F16L 13/14

U.S. Cl. 285—382.4 6 Claims



1. A drill tube connection which includes two drill tubes of substantially similar high rigidity and substantially equal external cross-section, the connection being capable of withstanding substantial axial and rotational drilling forces and of permitting core extraction therethrough, each drill tube having a threaded zone near its end and at least one of them having a zone of enlarged internal diameter defining an annular cavity in the vicinity of its threaded end, and a tubular nipple connecting the tubes in aligned relationship, the tubular nipple being no greater in external cross-section than the external cross-section of the tubes so that the connection is no greater in external cross-section than the tubes, the nipple having zones towards either end threaded complementarily to the threads of the end zones of the tubes, the threaded zones of the nipple being received by, and engaged with the threaded end zones of the tubes and at least one end of the nipple having a zone of enlarged outer diameter which occupies the cavity for resisting axial forces on the connection.

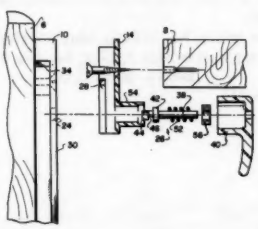
4,530,528
DOUBLE ACTION CRIB DROP SIDE LOCK

Louis Shamie, 630 Ave. V, Brooklyn, N.Y. 11223

Filed Feb. 22, 1983, Ser. No. 468,359

Int. Cl.³ E05C 5/02

U.S. Cl. 292—60 10 Claims



1. A double action securing device for the drop side of a crib, comprising:

a guide member (10) having an opening (24) therein with a lower edge and parallel side edges, said guide member adapted to be connected to one of the drop side and crib;

a slide member (14) slidably mounted to said guide member for relative movement between a raised and lowered position with respect to said guide member, said slide member adapted to be connected to the other of the drop side and crib;

a catch pin (26) rotatably and axially mounted to said slide

member, said catch pin having a substantially rectangular head (44) defining a recess (46), said head being of a size to pass into said guide member opening (24) and said opening positioned on said guide member to receive said head in one of said raised and lowered positions, with said recess receiving said opening lower edge to lock said slide member to said guide member and so that said slide member can be unlocked from said guide member by first rotating said catch pin, then raising said slide member to withdraw said opening lower edge from said head recess and then axially withdrawing said head from said guide member opening, said head having an end portion (44*a*) adjacent said head recess which extends beyond said guide member opening, over one side edge of said guide member opening with rotation of said catch pin, said end portion having a flat edge and said substantially rectangular head (44) having a rounded corner diagonally from said first mentioned corner (44*b*), said first mentioned head of said catch pin comprising an outer head (44), said catch pin including an inner head (42) having a shape which precludes entry of said inner head into said guide member (24) opening for bearing against a surface of said guide member and defining a portion of said recess;

said guide member having a raised surface (60) adjacent said opening thereof and above said end portion (44*a*) of said catch pin head with said catch pin rotated so that upward sliding movement of said slide member with respect to said guide member is precluded;

said end portion (44*a*) of said catch pin head (44) includes a corner (44*b*), said guide member including a surface (48) adjacent said opening against which said corner is engageable with rotation of said catch pin for providing a friction locking between said catch pin head and said guide member, with said flat edge being parallel to said surface (48);

said slide member (14) includes a cylindrical post (54), said catch pin (26) extending axially through said post, a retainer (56) connected to said post and embracing said catch pin; and

biasing means comprising a spring (52) extending in said post and axially around said catch pin and engaged against said inner head (42) and said retainer (56) for biasing said catch pin inner head axially toward said guide member with respect to said slide member.

4,530,529

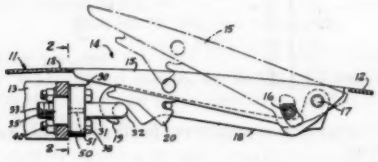
EXTERNALLY ACCESSIBLE ADJUSTER FOR FLUSH LATCHES

Lloyd R. Poe, Long Beach, and Bernard W. Henrichs, Villa Park, both of Calif., assignors to Hartwell Corporation, Placentia, Calif.

Continuation of Ser. No. 153,420, May 27, 1980, abandoned. This application May 7, 1982, Ser. No. 375,817

Int. Cl.³ E05C *5/00*

U.S. Cl. 292—113 **2 Claims**



1. A latch mechanism for joining first and second members, comprising

a latch arm mounted to the first member;

a keeper element for engaging said latch arm;

a screw threaded shaft extending from said keeper element;

a guide on the second member slidably receiving said shaft;

a wheel screw threaded on said shaft, rotatably mounted in said guide and having a ring of radially extending slots accessible in sequence through an access opening in the first member to a turning tool; and

at least one leaf spring fixed relative to the guide and having a detent biased by said leaf spring toward engagement with said slots of said wheel.

4,530,530

LOCKING LATCH ASSEMBLY FOR MOUNTING AN ELECTRONIC COMPONENT DRAWER IN A RACK

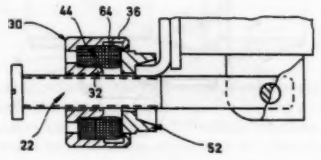
Lothar F. Schaefer, Hummelbaum 22, D 7253 Renningen, Fed. Rep. of Germany

Filed Sep. 23, 1982, Ser. No. 422,874

Claims priority, application European Pat. Off., Sep. 29, 1981, 81710048.0

Int. Cl.³ B65D *45/00*; **F16B** *37/00*

U.S. Cl. 292—256.75 **12 Claims**



1. A locking latch assembly for mounting an electronic component drawer in a rack, comprising

(a) a threaded bolt including joint means for pivotal connection to a rack, the pitch of the threadings of the threaded bolt being chosen so as to warrant self-locking under axial loads established under operational conditions,

(b) a threaded clamp ring carried on the threaded bolt and including a spring chamber extending to one end face of the clamp ring,

(c) spring means arranged in the spring chamber and

(d) a latch ring arranged on the threaded bolt between the clamp ring and the joint means for free axial movement and including a conical counterbore flaring towards the free end of the threaded bolt and adapted to receive a latch hook of the drawer, the end face of the latch ring facing the clamp ring engaging the spring means, characterized in that

(e) said spring means comprise a generally cylindrical sleeve-shaped all metal cushion,

(f) said spring cushion is arranged between an outer circumferential wall of the spring chamber and a support stud axially projecting from a bottom wall of the spring chamber so as to provide a close fit therebetween in the radial direction only along a portion of its axial extension, and

(g) said clamp ring is formed with first elements of a claw coupling adapted to cooperate with second complementary elements provided on a dynamometric key.

4,530,531

DEVICE FOR SECURING SLIDING CLOSURES

Carl P. Mantini, 4418 Eggars Dr., Freemont, Calif. 94536

Filed Dec. 8, 1983, Ser. No. 559,257

Int. Cl.³ E05C *19/00*

U.S. Cl. 292—302 **21 Claims**

1. A device for securing closures such as a door which moves in a door frame into a closed position against a doorjamb, comprising:

a first latch section securable to the face of said door;

fastening means for securing said first latch section to the face of said door;

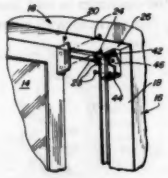
a second latch section securable to said doorjamb;

fastening means for securing said second latch section to said doorjamb;

complementary interlock means between said first and sec-

ond latch sections for facilitating securing the latch sections and locking the door to the doorjamb when the latch sections are joined in said closed position; and

one of said first and second latch sections having wall means projecting outwardly from the respective door face and



doorjamb in spaced relationship to the other of said door face and doorjamb and cooperating with the other latch section to define a substanially closed compartment on the exterior of the door when the door is in said closed position which conceals said fastening means when the latch sections are joined.

4,530,532

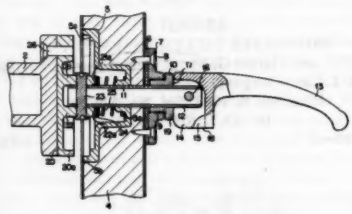
UNLATCHING DEVICE FOR LATCH OF REFRIGERATION CHAMBER OR THE LIKE

Toshimichi Fujiya, No. 4-22, Kounandai 6-chome, Kounan-ku, Yokohama-shi, Kanagawa-ken, Japan

Filed Mar. 2, 1983, Ser. No. 471,260

Int. Cl.³ E05B *15/02*

U.S. Cl. 292—341.15 **4 Claims**



1. An unlatching device for a latch device for a door of a chamber, comprising: an operation rod extending through a frame wall for the door between the exterior and interior of said chamber, said operation rod being pivotally connected at its outer end to a mounting base fitted in a case and a latch support of said latch device; and a manipulation handle pivotally connected to the inner end of said operation rod by means of a pivot shaft extending in parallel with said frame wall, said manipulation handle having a first contact surface and a second contact surface selectively contactable with a handle seat surface adjacent to the inner surface of said frame wall, the distance between said first contact surface and said pivot shaft being greater than the distance between said pivot shaft and said second contact surface, wherein the position of said handle seat surface relative to the manipulation handle is adjustable by adjusting sleeve means, and in the normal state, said first contact surface is held in the contact with said handle seat surface to pull and hold said latch support on the outer surface of said frame wall, while in an emergency said manipulation handle is rotated about said pivot shaft to bring said second contact surface into contact with said handle seat surface so as to lift said latch support away from said outer surface of said frame wall, thereby to disengage said latch support from a latch of said latch device and allow opening the door.

4,530,533

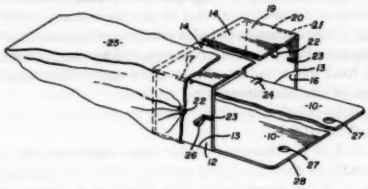
SUPPORT COLLAR FOR A TRASH BAG

Lynn Dieter, 4225 Nottingham Dr., Youngstown, Ohio 44511

Filed Aug. 2, 1983, Ser. No. 519,542

Int. Cl.³ B65B *67/12*; B65F *1/06*

U.S. Cl. 294—1.1 **1 Claim**



1. A support collar for a trash bag as formed from a foldable cardboard blank consisting of vertically spaced top and bottom rectangular portions, said bottom portion being substantially wider than said top portion, horizontally spaced parallel square side walls joining said top and bottom portions, hinged square extensions of said walls movably positioned in sliding engagement with said top and bottom portions, means for locking said side wall extensions to said top portion, means in said side walls for securing a trash bag thereto, said securing means constituting an opening in said side walls and notches in adjacent edges of said side walls whereby a portion of said trash bag may be pushed through said openings and pulled into said notches in fastening engagement.

4,530,534

CONNECTION MEANS, PARTICULARLY FOR A SUSPENDED LOAD

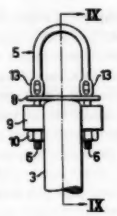
Lars O. A. Fredriksson, Växjö, Sweden, assignor to K A Bergs Smide AB, Gemla, Sweden

Continuation of Ser. No. 96,044, Nov. 20, 1979, abandoned. This application Dec. 28, 1981, Ser. No. 334,588

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1978, 2851708

Int. Cl.³ B66C *1/14*

U.S. Cl. 294—82.11 **8 Claims**



1. A connection means for a suspended load which includes a roundsling that has a predetermined lifting capacity and

comprises a fiber bundle encased in a sleeve, said connection means including a coupling member, said coupling member comprising a U-bolt and a removable bridge member extending between the shanks of said U-bolt to connect them to one another and having substantially the same lifting capacity as said roundsling, the portion of said bridge member between said U-bolt shanks being engageable by said roundsling for supporting said roundsling wherein the cross section of at least that part of the circumferential area of peripheral surface of the coupling member which is to be engaged by the roundsling at normal load has a radius of curvature (r_b) which satisfies at least one of the conditions

(1) $r_b \cong 5 + 0.3\ d_r$

(2) $r_b \cong 5 + 0.05\ U_r$

in which d_r is the diameter of the cross sectional area of the fiber bundle of the roundsling and U_r is the circumference of the sleeve of the roundsling and in which it is presumed that the fiber bundle is unloaded and occupies circular cross sectional area in the roundsling and that r_b, d_r and r_r are all measured in mm.

4,530,535

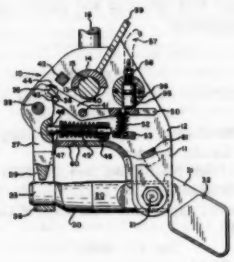
CARGO HOOK

John E. Hargreaves, Coquitlam, Canada, assignor to Cranston Machinery Company, Inc., Oak Grove, Oreg.

Filed Sep. 26, 1983, Ser. No. 535,898

Int. Cl.³ B66C *1/34*

U.S. Cl. 294—82.24 **18 Claims**



1. A cargo hook comprising a housing, suspension means for said housing in an upper portion of said housing, a load support pin mounted for vertical movement on a horizontal pivot in one side of a lower portion of said housing, a vertical latch arm mounted at its upper end on a horizontal pivot in the opposite side of said housing, a saddle on the lower end of said latch arm movable into engagement with a free end of said pin to support said pin in horizontal position, means for swinging the lower end of said latch arm away from said free end of said pin to disengage said sadle from said pin and allow said pin to pivot downward on said first horizontal pivot, a pawl arranged to hold said latch arm in a closed position supporting said pin, and means to release said pawl allowing said latch arm to release said pin.

4,530,536

LIFTING TONGS

James N. Williams, 1643 Market St., Mount Ephraim, N.J. 08059

Continuation-in-part of Ser. No. 339,108, Jan. 13, 1982, Pat. No. 4,452,481. This application Jan. 19, 1984, Ser. No. 571,950

Int. Cl.³ B66C *1/42*

U.S. Cl. 294—118 **6 Claims**

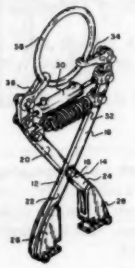
1. Lifting tongs for a crane comprising:

a pair of tong arms, said tong arms being pivoted together intermediate the ends thereof forming an upper tong arm portion and a lower tong arm portion on each tong arm;

means for moving said lower tong arm portions toward and away from each other;

a jaw adapted to be mounted to the end of each of said lower tong arm portions;

each of said jaws including a substantially horizontally extending slot having an opening toward the interior of said tongs so that the openings in said jaws face each other and a substantially flat vertical wall extending upwardly from



the top of the opening of said slot whereby, when said jaws are closing, said vertical walls guide the edges of the article to be lifted into said slots.

4. Lifting tongs as claimed in claim 1 wherein said means for moving said lower tong arm portions toward and away from each other includes a pneumatic cylinder means.

5. Lifting tongs as claimed in claim 4 further including a tension spring biasing said lower tong arm portions into a closed position.

4,530,537

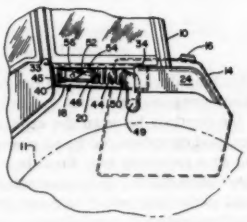
MOVEABLE FILLER ASSEMBLY

John J. Allen, and Harold G. Meitl, both of Darien, Ill., assignors to J. I. Case Company, Racine, Wis.

Filed Sep. 6, 1983, Ser. No. 529,294

Int. Cl.³ B62D *25/00*

U.S. Cl. 296—1 C **4 Claims**



1. A fuel filler assembly in a motor vehicle comprising:

a motor vehicle fuel tank;

a basin connected in a body of said motor vehicle having a door covering an opening in said basin;

a filler receptacle moveable synchronously with said door;

said receptacle being secured to an elastomeric section permitting a multi-angular displacement of said receptacle;

said elastomeric section connected with said fuel tank;

connecting means for coupling said receptacle with said door and permitting a limited displacement of said receptacle relative to said door;

said connecting means comprising a collapsible link secured to one side of said receptacle;

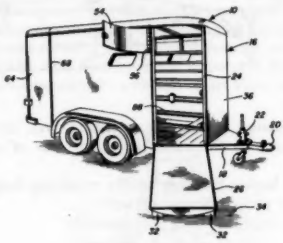
said door displacement automatically bringing said receptacle into and out of said concealed basin.

4,530,538

FORWARD ENTRANCE, REAR EXIT HORSE TRAILER

Carl B. Greene, Jr., and Carl B. Greene, III, both of P.O. Box 948, Chickasha, Okla. 73018

Filed Jan. 17, 1984, Ser. No. 571,841
Int. Cl.³ B60P 3/04
U.S. Cl. 296—24 C 5 Claims



1. An animal trailer including a wheeled frame having front and rear ends, an animal enclosure mounted on said frame, said front end including a forwardly projecting towing tongue extending forwardly of said enclosure, said enclosure including a central stationary transverse front wall and defining opposite side forwardly and oppositely outwardly opening animal ingress openings on opposite sides of said stationary front wall, first closure structures removably closing said ingress openings, said enclosure including an open rear end defining an animal egress opening, and second closure structure removably closing said egress opening, said enclosure rear end including a central upstanding upright, a front-to-rear extending upstanding partition disposed in said enclosure and mounted at its rear end from said upright for horizontal swinging of the front end of said partition laterally of the front end of said enclosure between the remote opposite side marginal portions of said stationary transverse front wall, and coacting means carried by the front end of said partition and the front end of said enclosure operative to releasably latch said front end of said partition, selectively, in first and second positions at least closely adjacent the remote side marginal portions of said stationary front wall and a third center position disposed centrally intermediate said side marginal portions of said stationary front wall, said first closure structure including vertically swingable combined closure door and ramp structures swingable between upstanding closed position closing said ingress openings and outwardly and downwardly inclined open ramp defining positions.

4,530,539

INFANT SEAT FOR CANTILEVERED MOUNTING ONTO A TABLETOP

Ira Gaber, W. Norwalk, Conn., and Harry E. Lawrence, III, Glen Ridge, N.J., assignors to J. C. Penney Co., Inc., New York, N.Y.

Filed Jul. 30, 1984, Ser. No. 635,609
Int. Cl.³ A47B 39/00
U.S. Cl. 297—174 14 Claims

1. An infant seat for cantilever mounting to a horizontally disposed tabletop and self-adjustable clamping to such tabletop comprising:

a seat back pivotably connected, at a lower side thereof, to a rear side of a seat bottom;

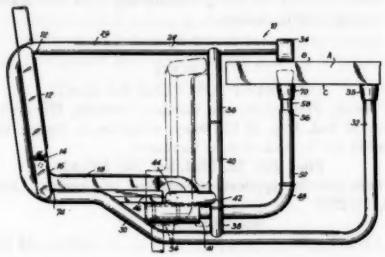
a pair of spaced-apart support members, each said support member integral in structure and having a top portion adapted as an upper support arm and a bottom portion adapted as a lower support arm, said lower support arm longer than said upper support arm, said lower support arm adapted to engage an under surface of a tabletop and said upper support arm adapted to engage an upper surface of the tabletop for cantilever mounting to the tabletop;

a first connector member affixed to each said upper support arm and disposed downwardly therefrom;

a second connector member affixed to and upwardly disposed from each said lower support arm, said second connenector member in axial alignment with said first connector member;

a third connector member in axial alignment with each said first and second connector member and in rotatable engagement therewith;

a cross member extending between and affixed to each said third connector member, said seat bottom pivotably attached to said cross member at a location on said seat bottom forward of its pivotable attachment to said seat back; and



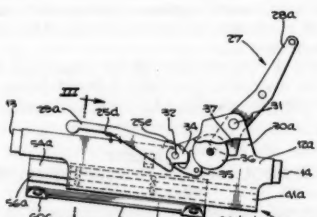
a clamping support arm assembly affixed to said seat bottom, said clamping support arm assembly having a member projecting generally outwardly and upwardly as it extends from a forward side of said seat bottom and a means associated with said outwardly and upwardly projecting member for self-adjustable engagement of the under surface of the tabletop, said self-adjustable means adapted to exert a force against the under surface of the tabletop, this force in cooperation with the engagement of the upper support arm on the upper tabletop surface provides clamping engagement to the tabletop.

4,530,540

INTEGRAL TRACK VEHICLE SEAT APPARATUS

Richard Hayden, Troy, and Fred F. Neumann, Rochester, both of Mich., assignors to American Safety Equipment Corporation, Troy, Mich.

Filed Sep. 21, 1983, Ser. No. 534,332
Int. Cl.³ A47C 1/02
U.S. Cl. 297—341 16 Claims



1. An integral track vehicle seat apparatus having:

a pair of laterally spaced side rails; seat cushion mounting means secured to said rails for mounting a passenger receiving seat thereto; seat back mounting means secured to said rails for mounting a passenger supportive seat back thereto; floor anchor means for securing the seat side rails

to a vehicle; and track means formed integrally of said rails and floor anchor means for providing forward and backward sliding movement of said seat relative to said vehicle, the improvement in said track means comprising:

upper and lower track members, each having a pair of spaced vertical front and back walls and a pair of spaced horizontal top and bottom walls, a first one of said top and bottom walls extending between said front and back walls and a second one of said top and bottom walls extending between said front and back walls, but ending in spaced relation to one of them to provide each of said members with portions of open box section configuration, said members being in internested sliding fit relation whereby said portions, including said walls provide a plurality of longitudinally extending bearing raceways within said box section configurations.

4,530,541

BACK REST FOR VEHICLE SEATS

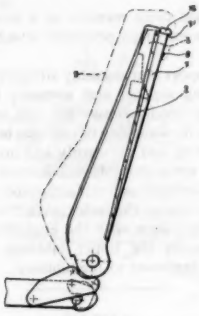
Jörg Resag, Filderstadt, and Gerhard Schmale, Hückeswagen, both of Fed. Rep. of Germany, assignors to Keiper Recaro GmbH & Co., Fed. Rep. of Germany

Filed Jun. 16, 1983, Ser. No. 505,420

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1982, 3222505

Int. Cl.³ A47C *7/02*

U.S. Cl. 297—452 **12 Claims**



1. A back rest for a vehicle seat, particularly for a motor vehicle seat, comprising:

side beams formed as shaped rails;

a yoke portion extending from one side beam to another side beam in the vicinity of upper ends of the side beams and being formed as a bending and kinking resistant spacer which abuts the side beams but is unconnected thereto, said spacer extending rearwardly beyond the side beams at least in the area of its end sections which abut the side beams; and

a lateral element engaging the side beams from the rear and being attached to outer sides of the side beams, said lateral element also abutting a back side of the spacer.

4,530,542

NON-FERROUS WHEEL CENTER WITH CHROMED STEEL COVER

Martin A. Spiegel, Compton, Calif., and Greg Weld, Lee's Summit, Mo., assignors to Mr. Gasket Company, Cleveland, Ohio

Filed Jun. 29, 1983, Ser. No. 509,818

Int. Cl.³ B60B *3/00, 7/00*

U.S. Cl. 301—37 R **13 Claims**

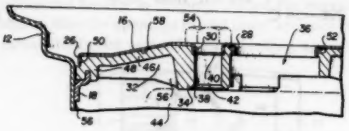
1. A wheel, comprising:

a non-ferrous metal, structural wheel center having an outboard side and an inboard side;

a rim connected to said wheel center for receiving a tire;

means for mounting said wheel center on an axle hub of a vehicle for rotation of the wheel about a central axis thereof;

a radially outwardly facing shoulder formed around the outboard side of said wheel center adjacent said rim;



a chrome plated, steel cover extending over, covering and conforming to the entire outboard side of said wheel center;

said cover having an outer axially extending flange around the outer periphery thereof; and

said flange engaging over said shoulder.

4,530,543

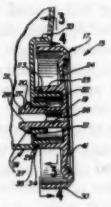
PLASTIC WHEEL HAVING AN ANNULAR BEARING SUPPORT

James W. Keane, White Bear Lake, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sep. 26, 1983, Ser. No. 535,982

Int. Cl.³ B60B *1/06, 9/10*

U.S. Cl. 301—63 PW **14 Claims**



1. For use in vacuum cleaners and the like having a body adapted to be moved over a floor surface, an improved wheeled support structure comprising:

a wheel mount on the body defining an outwardly opening recess having an inwardly facing annular lock surface, and means defining an annular bearing surface coaxially of said recess; and

a wheel having a resiliently deflectible latch element extending inwardly through said recess and having turned latch shoulder means arranged to be disposed inwardly of said annular lock surface for preventing axially outward removal of said latch element from said recess, and a wheel support defining an annular radially inwardly facing mounting surface slidably concentrically carried on said bearing surface.

4,530,544

PRESSURE PROPORTIONING VALVES

Ian N. Joseph, Avon, England, assignor to Bendix Limited, Bristol, England

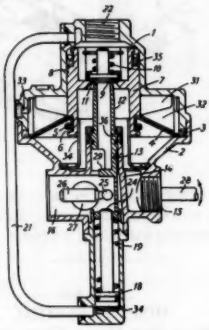
Filed Feb. 23, 1984, Ser. No. 582,692

Int. Cl.³ B60T *8/18, 11/34*

U.S. Cl. 303—22 R **6 Claims**

1. A variable pressure proportioning device comprising a housing having an inlet pressure chamber, an outlet pressure chamber, a fluid pressure responsive member slidable in said housing and having a fixed effective area exposed to the fluid

pressure level in the inlet chamber, a diaphragm supported by said housing and having an effective area which varies in response to movement of said diaphragm within said housing, said effective area of said diaphragm being exposed to the fluid pressure level in the outlet chamber, said diaphragm being connected to said fluid pressure responsive member and acting in opposition to the forces applied to the member by the pressure level acting on the fixed effective area of the latter, a pressure ratio control member slidably mounted in said housing, a double valve assembly comprising an exhaust valve seat carried by said pressure ratio control member, an outlet valve seat carried by said fluid pressure responsive member, and a valve element engageable with said outlet valve seat to control



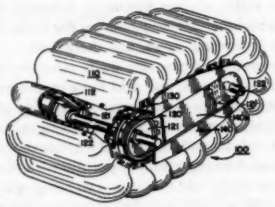
communication between said inlet and outlet chambers and engageable with said exhaust valve seat to control communication between said outlet chamber and said exhaust chamber, resilient means yieldably urging said valve element into sealing engagement with said control valve seat, means for moving said pressure ratio control member in said housing to vary the force required to cause said valve element to close against said valve seats and to thereby vary the effective ratio of the pressures in the inlet and outlet pressure chambers, and a biased pressure responsive means for progressively changing the fluid pressure force required to urge said valve element against the control valve seat after the pressure level in one of said inlet and outlet chambers attains a predetermined level.

4,530,545

SEGMENTED AIR-TRACK APPARATUS

William R. Bertelsen, 2720 31st Ave., Rock Island, Ill. 61201

Filed Oct. 28, 1982, Ser. No. 437,311
Int. Cl.³ B62D *55/18*
U.S. Cl. 305—16 **6 Claims**



1. A buoyant-wheel vehicle adapted for traversing various terrain comprising

a vehicle body including means for controlling vehicle movement and function,

said vehicle body being supported for traversing various terrain by a plurality of trapped air cushion crawlers,

said trapped air cushion crawlers comprising a plurality of individual air pressurized inflatable casing units interconnected to each other and supported for movement in an endless path of movement forming an air-track crawler upon which the vehicle is supported.

said interconnected individual air-pressurized inflatable casing units are carried by a plurality of drive chains supported for movement in an endless path of movement upon sprockets rotatably supported on shafts which define the run length of said air-track crawler;

each one of said interconnected individual air-pressurized inflatable casing units includes an internal tension cable carried within said casing unit to keep the outermost portion thereof flat and prevent ballooning thereof when subjected to air pressure;

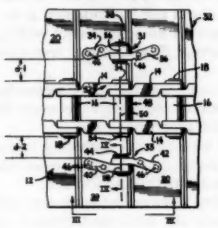
said vehicle further including skid rests supported from said drive chains and through bolted between individual casings to support said vehicle in the absence of pressurized air in said casings sufficient to support said vehicle thereon.

4,530,546

ENDLESS TRACK COUPLING APPARATUS

Thomas C. Meisel, Jr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US82/00316, § 371 Date Mar. 12, 1982, § 102(e) Date Mar. 12, 1982, PCT Pub. No. WO83/03231, PCT Pub. Date Sep. 29, 1983
PCT Filed Mar. 12, 1982, Ser. No. 573,973
Int. Cl.³ B62D *55/20*
U.S. Cl. 305—39 **5 Claims**



1. Apparatus (32) for releasably connecting a first end portion (48) to a second end portion (52) of a track assembly (12), said track assembly (12) having a plurality of pivotal joints, each joint, except one, including a pair of inner links (14), a pair of outer links (14), a bushing (16) connecting said inner links (14), and a pin (18) extending through said bushing (16) and connecting said outer links (14), and a plurality of track shoes (20) connected to said links (14), comprising:

a single discrete first coupling assembly (31) having first and second coupling members (34,36) and a first pin (38);

a single discrete second coupling assembly (33) having third and fourth coupling members (40,42) and a second pin (44), said second coupling assembly (33) being spaced from said first coupling assembly (31) and from said track links (14);

said first and second coupling assemblies (31,33) being substantially similar and free from connection with other coupling assemblies;

means (46) for releasably joining said first and second coupling assemblies (31,33) to said track shoes (20); and,

said one pivotal joint including a pair of inner links (14), a pair of outer links (14), a bushing (16) connecting said inner links (14), and being free of a connecting pin (18).

4,530,547

PULL-OUT GUIDE ASSEMBLY FOR DRAWERS

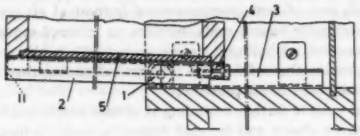
Erich Röck, and Josef Brunner, both of Höchst, Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Jul. 13, 1983, Ser. No. 513,273

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1982, 8221386[U]

Int. Cl.³ F16C 29/04

U.S. Cl. 308—3.8 8 Claims



1. In a pull-out guide assembly for guiding movement of a drawer or the like into and out of a body of an article of furniture, said assembly being of the type including first and second arrangements for use on respective first and second sides of the drawer, each said arrangement including a supporting rail adapted to be mounted on a respective side wall of the body of the article of furniture and a pull-out rail adapted to be mounted on a respective side of the drawer, the improvement wherein:

each said supporting rail includes an upwardly extending vertical flange and a horizontal flange extending inwardly from the top of said vertical flange;

each said pull-out rail includes a horizontal flange located above said horizontal flange of the respective said supporting rail;

each said supporting rail has mounted at an outer end thereof a roller in rolling contact with the bottom surface of said horizontal flange of the respective said pull-out rail;

each said pull-out rail has mounted at an inner end thereof guide means for guiding contact with opposite surfaces of said horizontal flange of the respective said supporting rail;

said first arrangement including means for laterally guiding and restricting movement between the respective said pull-out and supporting rails;

said second arrangement including means to enable unrestricted lateral movement between the respective said pull-out and supporting rails; and

said rails being constructed such that said rollers and said guide means are positioned beneath the bottom of the drawer.

4,530,548

ARTICLE DISPENSER

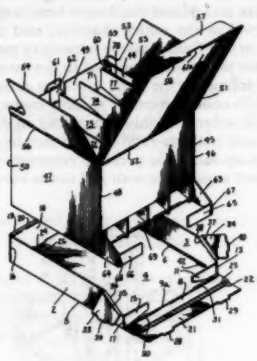
William S. Spamer, Roswell, and Ronald J. Beerman, Atlanta, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Jun. 15, 1983, Ser. No. 504,519

Int. Cl.³ A47F 7/00

U.S. Cl. 312—45 12 Claims

1. An article dispenser comprising a bottom tray, an article receiving compartment extending upwardly from said bottom tray, said bottom tray comprising one side portion, said article receiving compartment comprising multiple side walls, a vertical separator upstanding from said bottom tray, an article platform disposed in interlocking relation with said vertical separator and angularly disposed with respect to an imaginary horizontal plane, said one side portion of said bottom tray extending outwardly with respect to the corresponding side wall of said article receiving compartment, said bottom tray comprising a bottom wall, said bottom wall comprising side edges, side panels joined respectively to said side edges of said bottom wall and extending upwardly therefrom, said article receiving compartment comprising four side walls interconnected in a rectilinear relationship, said side walls comprising lower portions respectively, and securing tabs extending respectively from said lower portions of two opposing of said



side walls and being disposed in face contacting relation respectively with two of said side panels disposed adjacent each end of said outwardly extending portion.

4,530,549

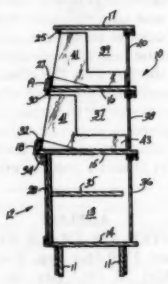
DISPLAY SYSTEM

Salvatore A. Genna, New Haven, Conn., assignor to Neil C. Russo, East Haven, Conn., a part interest

Filed Dec. 2, 1983, Ser. No. 557,480

Int. Cl.³ A47F 3/14

U.S. Cl. 312—121 3 Claims



1. A display case comprising a member defining spaced vertical side walls, shelves extending between said case side walls, a facia member extending across the front of each of said shelves and extending upwardly therefrom, a top member extending between said case side walls, whereby said top member, said case side walls, and said facia members define horizontally elongated open windows, a plurality of transparent bins on said shelves, said bins comprising a base member, spaced-apart, substantially L-shaped bin side walls, a front wall and a back wall defining a hopper portion with the vertical legs of said bin side walls, said bin back wall being spaced from said bin bottom wall, a baffle member extending between said bin side walls from the front wall thereof to said base member substantially under the back wall of said upright portion, said bins having an open tray portion behind said hopper portion defined by the horizontal legs of said bin side walls, said base and a rear wall for removal of articles from said bins, said hopper portion being substantially taller than said tray portion, said facia members concealing said baffles in said bins, said bins being positioned side by side on said shelves, the front walls of

said bins forming a closure for said open window, and displaying contents of said bins therethrough.

4,530,550

POWER SUPPLY UNIT FOR ELECTRONIC FLASH

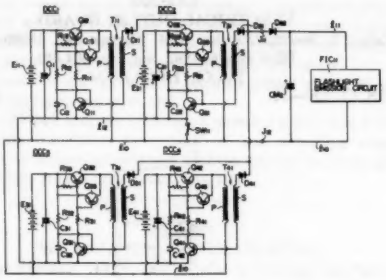
Isao Kondo, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Jul. 1, 1983, Ser. No. 509,945

Claims priority, application Japan, Sep. 13, 1982, 57-159227; Jan. 20, 1983, 58-7146[U]; Jan. 27, 1983, 58-10190[U]; Feb. 4, 1983, 58-17103

Int. Cl.³ H05B *41/32*; H02M *3/06*

U.S. Cl. 315—241 P **25 Claims**



1. A power supply unit for electronic flash comprising:

a plurality of charging units each including a separate D.C. source and a DC/DC converter for providing a booster action upon the voltage of the source, each of the charging units being operative to charge a main capacitor of an electronic flash; and

a plurality of diodes connected between each of the charging units and the main capacitor for directly connecting each charging unit to the main capacitor while preventing a reverse current flow from the main capacitor to each of the charging units.

4,530,551

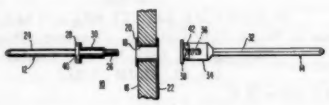
CIRCUIT CHANGE PIN FOR PRINTED WIRING BOARD

John E. Benasutti, North Wales, Pa., assignor to Burroughs Corp., Detroit, Mich.

Filed Jan. 12, 1984, Ser. No. 570,201

Int. Cl.³ H05K *1/00*; H01R *13/50*

U.S. Cl. 339—17 C **4 Claims**



1. A wiring change pin assembly comprising in combination:

a printed wiring board of predetermined thickness and having at least one plated-through hole,

an elongated body member comprised of a pair of separable body parts,

one of said body parts including a first shaft adapted to mate with an electrical connector, said first shaft having a threaded section at one extremity thereof, a shoulder formed on said first shaft, an intermediate portion of said first shaft situated between said shoulder and said threaded section, electrically insulative material disposed on said intermediate portion and on the surface of said shoulder contiguous with said intermediate portion of said first shaft, the length of said intermediate portion of said shaft being a function of said predetermined thickness of said printed wiring board, said threaded section and said intermediate portion of said first shaft being inserted into said plated-through hole, the cross-sectional dimension of said shoulder being greater than the diameter of said plated-through hole,

the other of said body parts including a second shaft adapted to have a wire wrapped thereabout, said second shaft having an enlarged section at one extremity thereof, said enlarged section having a central bore, electrically insulative material disposed on the edge of said enlarged section surrounding the opening of said bore, the cross-sectional dimension of said enlarged section being greater than the diameter of said plated-through hole, said bore being tapped to accommodate said threaded section of said first shaft, whereby said body parts are screwed together to effect the mounting of said enlongated body member on said printed wiring board, and wherein the insulated surface of said shoulder of said first shaft and the insulated edge of said enlarged section of said second shaft firmly contact respective opposed surfaces of said printed wiring board.

4,530,552

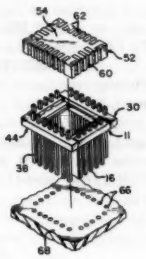
ELECTRICAL CONNECTOR FOR INTEGRATED CIRCUIT PACKAGE

Robert F. Meehan; William H. Rose, and David T. Shaffer, all of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 25, 1983, Ser. No. 555,257

Int. Cl.³ H01R *23/72*

U.S. Cl. 339—17 CF **7 Claims**



4. An electrical connector, comprising:

first and second dielectric frame members each of which has opposed side members in which electrical terminals are located at spaced intervals therealong, means extending between respective side members of each of the frame members enabling the frame members to be nested together with one side member forming each side of at least a four-sided structure with all of said side members being coplanar; and

means on said frame members maintaining said frame members as the four-sided structure so that the electrical terminals can be electrically connected to an electronic component.

4,530,553

MINIMUM INSERTION FORCE CONNECTOR

Sharanjit S. Aujla, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

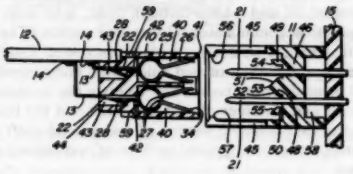
Filed Mar. 15, 1984, Ser. No. 589,762

Int. Cl.³ H01R *13/631*

U.S. Cl. 339—17 LC **17 Claims**

1. A connector comprising a plug and a receptacle, said plug comprising a housing having at least one row of socket terminals positioned in the housing, each of said socket terminals

comprising a main body part having a front end and a rear end; two arms extending from said front end, each arm having an inner curved portion and a substantially straight outer portion, the curved portions extending initially away from each other and curving round and towards each other, a contact position at each junction of a curved inner portion with an outer portion, and means for connecting a conductor to the socket terminal; said receptacle comprising a member interengaging with said housing of said plug, said member having at least one row of pin terminals, a pin terminal for each of said socket



terminals, and cam surfaces on said member positioned to engage with the outer ends of said straight outer portions of said socket terminals, said pin terminals extending beyond said cam surfaces; the arrangement such that on initial interengagement of plug and receptacle, the inner ends of said pin terminals pass between the contact positions on said arms, continued interengagement of said plug and receptacle moving said cam surfaces into contact with said outer ends of said straight portions of said arms and pushing said front ends inward to move said contact positions into contact with said pin terminals.

4,530,554

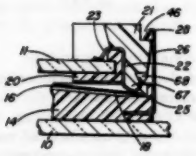
HIGH DENSITY LOW PROFILE MULTIPLE CONTACT CONNECTOR

Benne Velsher, Ottawa; Jaroslav M. Hvezda, Nepean, and Richard J. Middlehurst, Kanata, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Continuation-in-part of Ser. No. 566,037, Dec. 27, 1983,. This application Jun. 8, 1984, Ser. No. 618,886

Int. Cl.[3] **H01R** *13/64, 13/645, 13/506;* **H05K** *1/00*

U.S. Cl. 339—17 M **16 Claims**



1. A multiple contact connector, comprising;

an elongate bottom member for attachment to a circuit board and having top and bottom surfaces and inner and outer edges; a plurality of spring bottom contact members spaced apart along the bottom member, each bottom contact member including a cantilever contact portion extending over said top surface in a direction normal to the length of the bottom member and also including a tail portion extending through the bottom member and extending from said bottom surface for passage through said circuit board and connection to a circuit pattern on said circuit board;

an elongate top member for attachment to an edge of a further circuit board and having top and bottom surfaces and an outer edge; a plurality of top contact members spaced apart along the top member, each top contact member having a bottom leg extending over said bottom surface of said top member in a direction normal to the length of said top member towards said outer edge of said top member, and having a top leg extending from said top member to make contact with contact pads on said further circuit board, the bottom legs of the top contact members in said top member positioned to make contact with said cantilever contact portions of said bottom contact members in said bottom member on assembly of said top and bottom members together;

a spring member extending up from said bottom member along said outer edge and including a top portion adapted to extend over said outer edge of said top member and retain said top member on said bottom member.

4,530,555

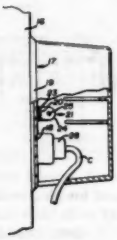
ELECTRICAL OUTLET GUARD

Robert E. South, P.O. Box 1674, Warsaw, Ind. 46580

Filed Jun. 6, 1983, Ser. No. 501,481

Int. Cl.[3] **H01R** *13/44*

U.S. Cl. 339—39 **3 Claims**



1. An improvement to an electrical outlet guard cover used to protect power cords plugged into electrical outlets, the improvement comprising means for securing the outlet guard cover to said electrical outlet, said outlet guard comprising a cover having a closed top portion, closed side portions, a closed back and a partially open bottom defining an open front being of a generally rectangular shape and said means for securing the outlet guard cover to said electrical outlet comprises a mounting bracket having an elongated base secured to said outlet, a pin having a flattened portion inwardly of one end thereof, a coil spring positioned on said pin and apertures in said cover for registering with said pin when said pin is in spring urged position.

4,530,556

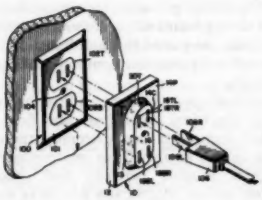
ELECTRICAL SAFETY RECEPTACLE

Thomas G. Bonus, 7320 State Rd., Cleveland, Ohio 44134

Filed Apr. 19, 1983, Ser. No. 486,360

Int. Cl.[3] **H01R** *13/639*

U.S. Cl. 339—75 P **17 Claims**



1. An electrical safety receptacle comprising:

(a) a housing,

(b) at least a first electrical plug receiving assembly comprising:

(i) a pair of electrically isolated contact portions mounted to said housing, each contact portion electrically connected to at least one corresponding backwardly extending prong insertable in an electrical socket to electrically energize said safety receptacle, each contact portion being operable for electrically contacting a plug prong inserted into one of a pair of prong-receiving slots in a front cover,

(ii) a lock actuator comprising an actuating wedge recessed in said housing and movable between a normal position and a locking position, said lock actuator actuable to change from said locking position to said normal position only by use of a tool, and

(iii) locking means operable to secure a prong in each of said prong-receiving slots when actuated by movement of said lock actuator from said normal position to said locking position, said locking means comprising two separate locking wedge locking elements each said wedge locking element being operable to secure a prong in one of said prong receiving slots, and

(iv) said lock actuator including a recessed screw operable to cause translation movement of said actuating wedge which in turn spreads said locking wedges to clamp plug prongs in said prong-receiving slots.

4,530,557

MICROMINIATURE CONNECTOR

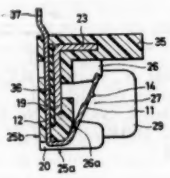
Kazuaki Katsube, Tokyo, and Masami Kuwabara, Yao, both of Japan, assignors to Sony Corporation, Tokyo and Hosiden Electronics Co., Ltd., Osaka, both of, Japan

Filed Nov. 22, 1983, Ser. No. 554,483

Claims priority, application Japan, Dec. 15, 1982, 57-219634

Int. Cl.³ H01R *13/50*

U.S. Cl. 339—75 M **15 Claims**



1. A connector comprising:

an insulating substrate having a substantially rectangular parallelepiped shape,

a plurality of strip-shaped contacts arranged substantially in parallel to one another at regular intervals, said contacts being molded integrally with said insulating substrate so as to extend through said substrate in a direction perpendicular to the lengthwise direction of said substrate with the opposing ends of said contacts projecting outwardly of said substrate, each said contact defining a terminal portion at one of its outwardly projecting ends, a contact portion at the other of its outwardly projecting ends, and a contact holding portion which is located between said ends and embedded within said insulating substrate,

each of said contact portions being bent back towards its corresponding contact holding portion to lie on one surface of said insulating substrate, the surface of said insulating substrate having contact receiving grooves therein which extend in the widthwise direction of said substrate and which are arranged along the lengthwise direction of said substrate for receiving said bent back contact portions,

an elongated metal reinforcing plate embedded within said insulating substrate, said reinforcing plate extending in the lengthwise direction of said substrate and being disposed adjacent to, spaced from, and in opposing relation to said contact holding portions, and

insulating layer means disposed between said reinforcing metal plate and each of said contact holding portions, said insulating layer means being made of an insulating material different from the material of said insulating substrate.

4,530,558

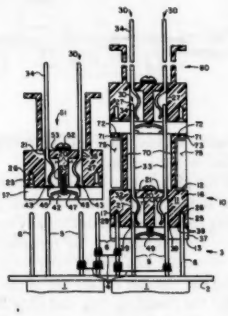
CONNECTOR LOCK ARRANGEMENT

William A. Reimer, Wheaton, Ill., assignor to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Dec. 19, 1983, Ser. No. 562,637

Int. Cl.³ H01R *13/631*

U.S. Cl. 339—75 M **5 Claims**



1. A connector arranged to establish electrical connection with and lock onto at least a portion of a plurality of terminating pins, said connector comprising:

a base of electrically insulating material and of rigid construction, including a lower surface, an upper surface, a front end surface, and a rear end surface;

a plurality of apertures formed in said base lower surface and arranged to engage said terminating pins, each aperture including a side wall;

a plurality of connector pins including a contact portion, said contact portion positioned within each of said apertures, said contact portion engaging and establishing electrical connection with corresponding ones of said terminating pins;

at least one channel formed in said base lower surface and extending to at least one of said end surfaces, said channel intersecting a plurality of said apertures;

a lock member positioned within said channel;

a plurality of fingers positioned between said intersected apertures and extending into said channel in the plane of said base lower surface, said fingers retaining said lock member within said channel; and

an actuator operated to deflect said lock member towards said aperture side wall and lock said terminating pin therebetween.

4,530,559

LOCKING MEANS FOR A PLUG AND RECEPTACLE CONNECTOR

Edgar Burns, Los Angeles; James W. Johnson, No. Hollywood, and Adele R. Kimbrough, Los Angeles, all of Calif., assignors to Automation Industries, Inc., Greenwich, Conn.

Filed Oct. 31, 1983, Ser. No. 546,973

Int. Cl.³ H01R *13/625*

U.S. Cl. 339—90 R **4 Claims**

1. In an electrical connector having a plug shell with a coupling ring rotatively mounted thereon and a receptacle for releasable receipt within an open end of the plug shell and coupling ring, internal walls defining the open end of the plug shell and coupling ring including a coded set of keyways align-

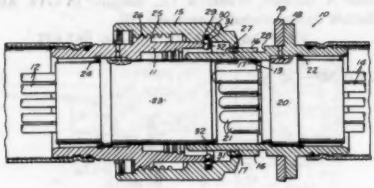
able to receive the receptacle which has a similarly coded set of keys the improvement comprising:

openings in the coupling ring and plug shell which are aligned when the keys and keyways are aligned;

plunger means slidingly received within the coupling ring opening;

spring means within the coupling ring opening resiliently urging said plunger means toward the plug shell for sliding receipt within the plug shell opening on key and keyway alignment locking said coupling ring and plug shell against relative movement; and

ball means in the plug shell opening continuously contacting the plunger means, said ball means having parts extending into the plug shell open end during key and keyway alignment which are engaged by the receptacle on connector mating to move the ball means fully within the plug shell opening and the plunger means out of the plug shell opening whereby the coupling ring and plug shell are movable relatively to each other.

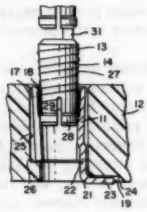


4,530,560

PLUG AND SOCKET CONNECTOR FOR TERMINATING SMALL GAUGE MAGNET WIRE

Charles H. Weidler, Lancaster, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 29, 1984, Ser. No. 625,992
Int. Cl.³ H01R *4/24*
U.S. Cl. 339—97 R **8 Claims**



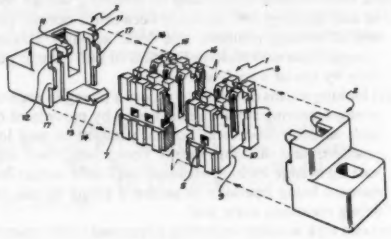
1. An electrical connector for terminating small gauge magnet wire comprising a resilient, tubular socket having entry and exit ends, a wall portion of the socket defining an internal wire engaging surface provided with a series of serrations and a contact portion extending from the socket; a plug member having a wire supporting surface receivable in the socket in an interference fit with the wire engaging surface and a head of increased width on a leading end whereby insertion of the plug through the entry end along the socket expands the socket so that the wire engaging surface is maintained spaced from a wire supported on the wire supporting surface of the plug until the surfaces are opposite, when exit of the head of the plug from the exit end permits the socket to resile to bring the serrations on the wire engaging surface into engagement with the wire to penetrate the insulation and effect multiple connections thereto.

4,530,561

EDGE CONNECTOR

Christopher W. Tyree, and John M. Poland, both of 155 Queen St., Beaconsfield, New South Wales, Australia (2015)

Filed Jul. 1, 1982, Ser. No. 394,221
Claims priority, application Australia, Jul. 8, 1981, PE9647
Int. Cl.³ H01R *13/514*
U.S. Cl. 339—134 **8 Claims**



1. Electrical connector comprising:

a supportive body;

a row of contact cavities arranged in said supportive body to receive contact elements;

retaining means associated with said cavities for retaining contact elements in said row;

feet means having upper and lower projections with inwardly directed re-entrant lips, the projections extending in a common direction, so as to lock the feet means securely onto the supportive body without interfering with the contact elements in said rows; and

upper and lower channels defined in said body to house the upper and lower projections therein.

4,530,562

CONNECTOR

Frederick E. Reynolds, Jr., Warwick, R.I., assignor to Electric Terminal Corporation, Warwick, R.I.

Filed Jun. 7, 1983, Ser. No. 501,772
Int. Cl.³ H01R *13/50, 11/22, 13/11*
U.S. Cl. 339—191 R **10 Claims**

1. An electrical contact for use in a receptacle comprising,

a flat base portion having a length and width,

a pair of flat side portions extending from said base portion in the same direction and connected to said base portion at parallel fold lines along the length of said base portion,

a first flat overhanging portion extending from the end of one side portion toward the other side portion at an acute angle to said one side portion to define an insertion region for receiving a plug prong with said base portion and said side portions,

said first overhanging portion extending from and connected to said base portion at a fold line along the length of said one side portion, and

a second flat overhanging portion extending from said other side portion toward said one side portion at an acute angle

to said other side portion and overlapping a portion of said first overhanging portion,

said second overhanging portion extending from and connected to said base portion at a fold line along the length of said other side portion,

said base portion, side portions and first and second overhanging portions all being formed of the same sheet of metal,

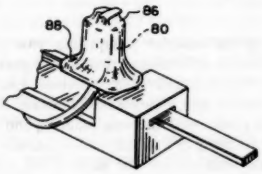
whereby a plug prong inserted in said region biases said first overhanging portion and said second overhanging portion through said first overhanging portion to provide good electrical contact along the length of said insertion region.

4,530,563

METHOD FOR MAKING A SOLDER JOINT AND THE SOLDER JOINT MADE THEREBY

Dorothy S. Brzezinski, Crystal Lake, Ill., assignor to Coilcraft, Inc., Cary, Ill.

Filed Sep. 30, 1982, Ser. No. 431,850
Int. Cl.³ H01R *5/04*
U.S. Cl. 339—275 B **16 Claims**



1. A method for forming a solder joint between a wire end portion of a coil mounted on a hub and an end tab of a male or female connector that can be mounted on a support fixed to the hub, said method including the steps of: placing at least one wire end portion adjacent an end tab; placing an encircling ring of material about the end tab and the at least one wire end portion, said ring of encircling material being sized to fit snugly about the end tab and the at least one wire end portion so that they are juxtaposed to each other and so that the resiliency of the at least one wire end portion urging it away from the end tab is sufficient to frictionally hold the ring of encircling material around the end tab and the at least one wire end portion; inverting and dipping the assembly of the end tab, the at least one wire end portion and the ring of encircling material into a solder bath; and removing the assembly from the solder bath and allowing it to cool and harden.

7. The method of claim 1 wherein said support mounts a plurality of end tabs of connectors which are parallel spaced from one another on said support, each end tab having at least one wire end portion held thereto by a ring of encircling material, and wherein all the assemblies of end tabs, wire end portions, and rings of encircling material are dipped simultaneously in a solder bath and removed therefrom without bridging of solder between the assemblies.

4,530,564

METHOD AND APPARATUS FOR PRODUCTION OF HOLOGRAPHIC OPTICAL ELEMENTS

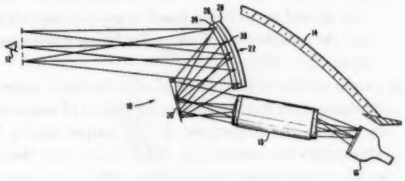
Donald H. Close, Santa Monica, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Aug. 18, 1980, Ser. No. 179,336
Int. Cl.³ G42B *5/32*; G43H *1/22*
U.S. Cl. 350—3.69 **13 Claims**

1. A holographic optical element assembly comprising:

a fabrication reflection holographic optical element, said fabrication reflection holographic optical element comprising a developed first reflection grating means for forming a first image when illuminated from a first preselected focal point, said first reflection grating means being positioned between a substrate and a cover plate, said first reflection grating means being configured for producing a system combiner holographic optical element; and

an undeveloped system combiner holographic optical element, said undeveloped system combiner holographic optical element having a substrate with a photosensitive layer thereon, said undeveloped system combiner holographic optical element lying adjacent and in front of said fabrication reflection holographic optical element, so that when exposed to a source of coherent radiation to which



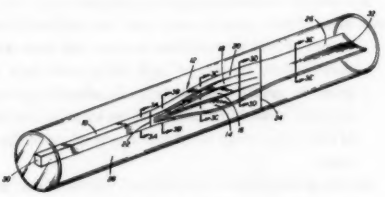
said photosensitive layer is sensitive from the side of said undeveloped system combiner holographic optical element away from said fabrication reflection holographic optical element, a latent image of second grating means is exposed in said undeveloped system combiner holographic optical element photosensitive layer, that latent image of a second grating means being such that when it is developed it is a combiner grating means for producing a second image different than the first image when illuminated from a second preselected focal point and is a desired image combiner grating.

4,530,565

OPTICAL TRANSFORMER USING CURVED STRIP WAVEGUIDES TO ACHIEVE A NEARLY UNCHANGED F/NUMBER

David A. Markle, Norwalk, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Dec. 20, 1982, Ser. No. 450,952
Int. Cl.³ G02B *5/14, 5/16*
U.S. Cl. 350—96.10 **4 Claims**



1. An optical transformer assembly comprising:

an input section of glass or fused silica having a rectangular shape, said section having an input end for receiving a non-uniform input beam of light, said section having a length to width ratio sufficient to output substantially uniform irradiance;

a transitional intermediate section having four strips of glass or fused silica, said strips being fused together to form a mating rectangular shape at the end attached to the output of said input section and an arcuate shape at the other end,

at a first transverse cross-section location of said intermediate section, said four strips being parallel with respect to each other with their ends disposed in stepped relationship, the side edges of each strip being fused to the side edge of the adjacent strip;

at a second transverse cross-section location of said interme-

diate section spaced from said first location toward the output of said intermediate section, said four strips being parallel with respect to each other with their ends disposed in stepped relationship, said steps being wider than the steps at said first cross-section location, the side edges of each strip being fused to the side edges of the adjacent strip;

at a third transverse cross-section location of said intermediate section spaced from said first and second locations toward the output of said intermediate section, the center two of said strips being fused in end to end relationship and the outside two of said strips being spaced from said center two strips;

an output section of glass or fused silica having a mating arcuate shape at the end attached to the output of said intermediate section, the output end of said output section having substantially the same arcuate shape as the input thereof, the length of said output section being sufficient to output substantially uniform irradiance; and

said optical transformer being fabricated from a single monolithic optical member which is substantially smooth, wrinkle free with parallel sides whereby the f/number from the input section to the output section is nearly unchanged.

2. An optical transformer assembly comprising:

an input section of glass or fused silica having a substantially circular shaped input and a substantially rectangular shaped output, said input end serving to receive a non-uniform input beam of light, said section having a length to width ratio sufficient to output substantially uniform irradiance;

a transitional intermediate section having four strips of glass or fused silica, said strips being fused together to form a mating rectangular shape at the end attached to the output of said input section and an arcuate shape at the other end;

at a first transverse cross-section location of said intermediate section, said four strips being parallel with respect to each other with their ends disposed in stepped relationship, the side edges of each strip being fused to the side edge of the adjacent strip;

at a second transverse cross-section location of said intermediate section spaced from said first location toward the output of said intermediate section, said four strips being parallel with respect to each other with their ends disposed in spaced relationship, said steps being wider than the steps at said first cross-section location, the side edges of each strip being fused to the side edges of the adjacent strip;

at a third transverse cross-section location of said intermediate section spaced from said first and second locations toward the output of said intermediate section, the center two of said strips being fused in end to end relationship and the outside two of said strips being spaced from said center two strips;

an output section of glass or fused silica having a mating arcuate shape at the end attached to the output of said intermediate section, the output end of said output section having substantially the same arcuate shape as the input thereof, the length of said output section being sufficient to output substantially uniformed irradiance; and

said optical transformer being fabricated from a single monolithic optical member which is substantially smooth, wrinkle free with parallel sides whereby the f/number from the input section to the output section is nearly unchanged.

4,530,566

OPTICAL FIBER DUPLEX COUPLER

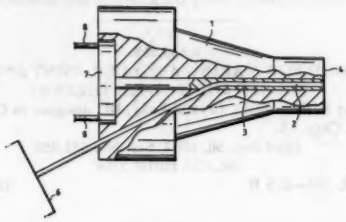
Alan M. Smith, Royston, and Peter J. Taylor, Cambridge, both of England, assignors to BICC Public Limited Company, London, England

Filed May 11, 1983, Ser. No. 493,406

Claims priority, application United Kingdom, May 12, 1982, 8213741

Int. Cl.³ G02B 7/26

U.S. Cl. 350—96.20 **13 Claims**



1. An optical coupler comprising two elongate optical guides which are so arranged that, over a part of their lengths extending from one end of the coupler, one of said optical guides surrounds and is substantially coaxial with the other of said optical guides with the neighbouring end faces of the two optical guides lying in a substantially common plane, and that, at a position intermediate the ends of the coupler, said two optical guides separate into distinct optical channels and, surrounding and enclosing said two optical guides, a body of such a material that light will be confined within the outer of said optical guides.

4,530,567

ROTARY OPTICAL CONNECTOR

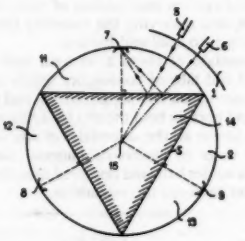
Daniel Simon, Jeumont, France, assignor to Jeumont-Schneider Corporation, France

Filed May 13, 1982, Ser. No. 377,816

Claims priority, application France, May 14, 1981, 81 09600

Int. Cl.³ G02B 5/14

U.S. Cl. 350—96.20 **10 Claims**

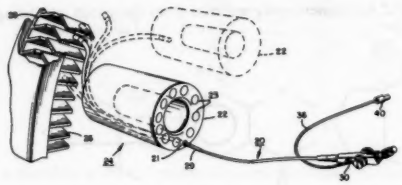


1. A rotary optical connector comprising light-emitting transmitter means and light-receiving means supported for relative rotation about a common axis, said transmitter means being directed for emitting light toward said axis and located at a greater distance from said axis than said receiving means, and reflector means supported inward of said receiver means relative to said axis for rotation about said axis in fixed relation to said receiver means, said reflector means being oriented for reflecting the light emitted toward said axis by said transmitter means to said receiver means during rotation of said transmitter means relative to said receiver means.

4,530,568
FLEXIBLE OPTICAL INSPECTION SYSTEM

Paul R. Haduch, West Milford, and Anthony Rega, Ridgefield, both of N.J., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Nov. 19, 1982, Ser. No. 442,882
Int. Cl.[3] G02B 5/17
U.S. Cl. 350—96.26 10 Claims



1. In an inspection instrument of a generally tubular flexible shape having a control head at a proximal end thereof and an objective assembly at the distal end thereof for viewing subject matter to be inspected, the improvement comprising:

a transitional segment and a deflector segment coupled thereto, said transitional segment and said deflector segment being disposed between said control head and said objective assembly;

control lines threading said transitional segment, said deflector segment, and terminating in said control head;

first means within said transitional segment for restraining flexure thereof;

second means within said deflector segment for restraining flexure thereof, said first restraining means restraining the flexure to a greater extent than the restraining of said second restraining means thereby allowing said deflector segment to have increased lateral movement relative to said transitional segment, a portion of said control lines terminating in said transitional segment with the balance of said control lines terminating in said deflector segment, forces for actuating individual ones of said control lines being provided by said control head; and wherein said transitional segment includes stiffening means to permit actuation of the portion of said control lines which control flexure of said deflector segment to the operator independently of the remaining portion of said control lines for independent flexure of said transitional segment and said deflector segment to provide a climbing-like ability to said inspection instrument to enable the instrument to pass through regions of a complex structure.

4,530,569
OPTICAL FIBERS COMPRISING CORES CLAD WITH AMORPHOUS COPOLYMERS OF PERFLUORO-2,2-DIMETHYL-1,3-DIOXOLE

Edward N. Squire, Glen Mills, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 294,789, Aug. 20, 1981, abandoned. This application Mar. 20, 1984, Ser. No. 591,486
Int. Cl.[3] C08F 214/26; G02B 5/14
U.S. Cl. 350—96.34 4 Claims

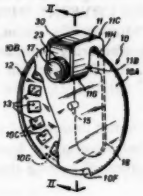
1. An optical fiber consisting of a core clad with an amorphous copolymer of perfluoro-2,2-dimethyl-1,3-dioxole with tetrafluoroethylene selected from the class consisting of dipolymers and of terpolymers containing in addition another ethylenically unsaturated monomer;

the proportion of perfluoro-2,2-dimethyl-1,3-dioxole in the dipolymer being at least about 11 mole percent of the dipolymer; and the proportion of perfluoro-2,2-dimethyl-1,3-dioxole in the terpolymer being at least about 12 mole percent of the tetrafluoroethylene content, the mole proportion of the third monomer being the smallest of all three monomers.

4,530,570
TRANSPARENCY VIEWER

Jean-Pierre Vitrac, Paris, France, assignor to Stereoscopes Lestrade & Cie., S.A., Vic Bigorre, France

Filed Apr. 7, 1983, Ser. No. 482,959
Claims priority, application France, Jan. 14, 1983, 83 00523
Int. Cl.[3] G02B 27/02
U.S. Cl. 350—241 11 Claims

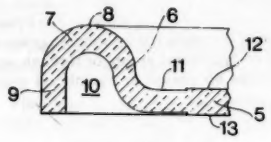


1. A device for viewing transparencies disposed circumferentially on a disk, comprising a case adapted to contain a disk, a pin adapted to mount said disk for rotation within said case, at least one peripheral opening in said case defining a manual access for the manual rotation of said disk on said pin, a pair of windows disposed in face to face relationship and so that said transparencies can move between them, a front member on one side of said windows adapted to support, in line with and spaced from said windows, an optical system comprising at least one lens, and a rear member on the opposite side of said windows adapted to constitute a shank for receiving a layer of an article of clothing between said case and said shank for clipping the device to the article of clothing.

4,530,571
MIRROR

John Connor, Coventry, England, assignor to ClearPlas Limited, Coventry, England

Filed Mar. 1, 1983, Ser. No. 471,189
Claims priority, application United Kingdom, Mar. 5, 1982, 8206512; Oct. 15, 1982, 8229588
Int. Cl.[3] G02B 5/08
U.S. Cl. 350—629 5 Claims



1. A mirror made of a synthetic plastics material comprising: a base having front and back surfaces, which each define a plane, and a peripheral edge; a rim upstanding from said base around the whole of said peripheral edge; and a metallised layer on one of said front and back surfaces of said base to provide second or first surface reflection respectively; wherein said rim has a peripherally-inner wall portion extending forwardly from said base, a crest portion defining a front peripheral convex face having a radius of curvature greater than the thickness of said base, and a peripherally-outer wall portion spaced from said peripherally-inner wall portion and terminating in substantially the same plane as said back surface of said base, such that, together, the peripherally-inner wall portion, the crest portion and the peripherally-outer wall portion form a U-shape, the thickness of said rim extending substantially

uniformly throughout said peripherally-inner wall portion, said crest portion and said peripherally-outer wall portion.

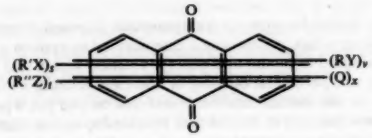
4,530,572

SUBSTITUTED ANTHRAQUINONE-TYPE ISOTROPIC DYES FOR LIQUID CRYSTAL DISPLAY DEVICES

William A. Huffman, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

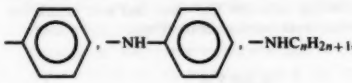
Filed Dec. 30, 1982, Ser. No. 454,701
Int. Cl.[3] G02F 1/13; C09K 3/34
U.S. Cl. 350—346 14 Claims

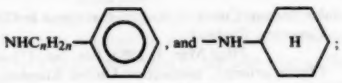
1. A composition of matter comprising a nematic, smectic or cholesteric liquid crystal material, at least one dichroic dyestuff, and an isotropic dyestuff having the general formula



wherein

R is independently selected from the group consisting of

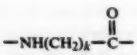




wherein R is linked to the anthraquinone core at the nitrogen atom of the amino group if R contains an amino group, or at an aromatic carbon if R contains no amino group;

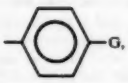
Y is independently selected from the group consisting of C_nH_{2n+1}, and OC_nH_{2n+1}; wherein Y is linked to R at the 4 position of the phenyl or cyclohexyl group if R contains a phenyl or cyclohexyl group, or through an alkyl group if R contains no phenyl or cyclohexyl group and Y is OC_nH_{2n+1};

R' is

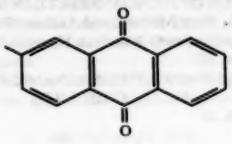


wherein R' is linked to the anthraquinone core at the nitrogen atom of the amino group;

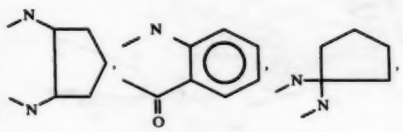
X is independently selected from the group consisting of $-(CH_2)_mCONH-G$, and

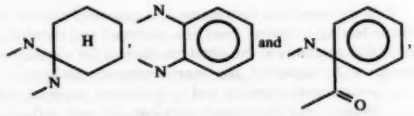


wherein G is



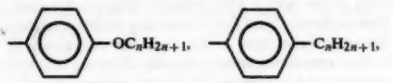
R''Z is independently selected from the group consisting of





wherein R''Z may be substituted in available positions with lower alkyl or alkoxy groups of about 1 to 4 carbon atoms;

Q is independently selected from the group consisting of H, OH, NH_2, CN, OC_nH_{2n+1}, NO_2, C_nH_{2n+1},



F, Cl, Br, SH, CHO and CF_3;

v is 0 or 4 to 8;

s is 0 or 1 to 4;

t is 0 or 1; and

x is 1 to 7;

n is 0 to about 20;

m is 0 to about 10; and

k is 0 to about 2

provided that when v is greater than 0, s and t are 0; when s is greater than 0, v and t are 0; and when t is greater than 0, v and s are 0, and Q can only be H; and further provided that when v is greater than 0, RY is substituted on the anthraquinone skeleton in at least the 1, 4, 5 and 8 positions, the 2, 3, 6 and 7 positions or the 2, 4, 6 and 8 positions; and when t is greater than 0, R''Z is substituted on the anthraquinone skeleton in the 1 and 2 positions so as to form an enclosed ring; wherein said isotropic dyestuff has an optical order parameter of about 0.

4,530,573

OPTOELECTRONIC MULTIPOSITION RF SIGNAL SWITCH

Herbert J. Wolkstein, Livingston, N.J., assignor to RCA Corporation, Princeton, N.J.

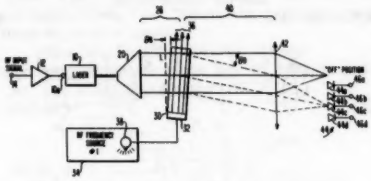
Filed Aug. 26, 1982, Ser. No. 411,827
Int. Cl.[3] G02F 1/11
U.S. Cl. 350—358 8 Claims

1. An optoelectronic switch for switching an RF input signal to one of a plurality of output terminals comprising in combination:

first means producing a collimated light beam which is modulated in accordance with the time varying value fo said RF input signal;

second means producing an RF control signal at a selectable one of a plurality of preselected frequencies;

third means positioned to intercept said collimated beam and responsive to said control signal for producing acoustic waves at a frequency dependent on that of said control signal for causing said beam to be deflected in passing through said third means by an angle dependent on said control signal frequency;



a plurality of optical pickup devices, positioned to intercept the deflected beam at different ones of its deflection angles, respectively whereby the optical beam may be directed to a specific one of said pickup devices depending on the particular preselected frequency produced by said control signal.

4,530,574

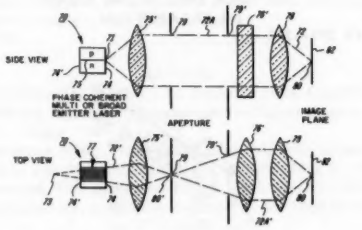
BEAM COLLIMATION AND FOCUSING OF MULTI-EMITTER OR BROAD EMITTER LASERS

Donald R. Scifres, Los Altos, and Robert A. Sprague, Saratoga, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 402,695, Jul. 28, 1982, abandoned. This application Aug. 6, 1984, Ser. No. 637,708

Int. Cl.³ G02B *13/08*

U.S. Cl. 350—420 **6 Claims**



1. An optical system said system including a lens system for collimating the radiation from a semiconductor laser, the laser near field having a single beam waist position in a first spatial direction near the emission facet of said laser and having an elongated but phase coherent near field emitting pattern in a second spatial direction which forms a far field pattern of low divergence beams,

said lens system for imaging said near field of said single beam waist position in said first spatial direction while imaging said elongated, phase coherent far field radiation beam pattern in said second spatial direction,

said lens system including means to image said far field radiation beam pattern in said second spatial direction to an intermediate image plane and

aperture means positioned at said intermediate image plane to block one or more lower power diffraction orders present in said far field radiation beam pattern.

4,530,575

VIDEO PROJECTOR LENS SYSTEM

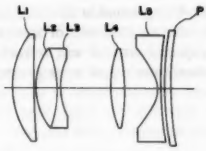
Kazuo Yamakawa, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 3, 1983, Ser. No. 463,634

Claims priority, application Japan, Feb. 12, 1982, 57-21736

Int. Cl.³ G02B *9/34, 13/18*

U.S. Cl. 350—432 **21 Claims**



1. A lens system for projecting onto a screen a video image formed on a face plate of a cathode ray tube comprising, from the screen to the tube side:

a first positive lens having a screen side convex surface;

a second positive lens;

a third negative lens;

a fourth biconvex lens; and

a fifth negative lens having a screen side concave surface, at least the fourth lens being made of a glass material, wherein the lens system includes at least one aspheric surface and fulfills the following conditions:

$1.2 < f_{123}/f < 2.5$

$0.5 < f_2/|f_3| < 2$

$\nu_2/\nu_3 > 1.5$

wherein:

f represents a focal length of the whole lens system;

f_{123} represents a total focal length from the screen side surface of the first positive lens to the tube side surface of the third negative lens;

f_2 represents a focal length of the second positive lens by itself;

f_3 represents a focal length of the third negative lens by itself;

ν_2 represents an Abbe number of the second positive lens with respect to d-line; and

ν_3 represents an Abbe number of the third negative lens with respect to d-line.

4,530,576

FIXED REFRACTOR OF ASYMMETRICAL PROFILE IDEAL FOR CONCENTRATING SOLAR ENERGY ON A SUITABLE COLLECTING SURFACE

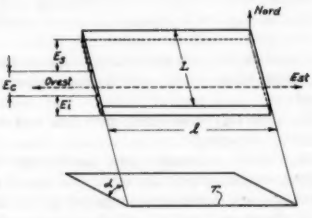
Tazio Pinelli, Pavia, and Francesco Sebastiano, Termoli, both of Italy, assignors to Societa' Italiana Vetro - SIV - S.p.A., Vasto, Italy

Filed May 5, 1982, Ser. No. 375,092

Claims priority, application Italy, May 19, 1981, 21810 A/81

Int. Cl.³ G02B *3/08*

U.S. Cl. 350—452 **8 Claims**



1. A stationary optical longitudinal refractor for concentrat-

ing solar radiation which comprises a first group of prismatic elements on one side of a plane which is perpendicular to said refractor and a second group of prismatic elements on the other side of said plane, said first and second group of prismatic elements being made of a transparent material and being of such a form as to refract light rays passing through said first and second group of prismatic elements toward said plane, each of said prismatic elements having a different size and different power of refraction,

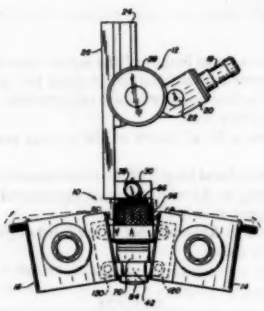
said refractor being capable of concentrating solar energy striking it into an absorber of substantially smaller area than the exposed area of said refractor, with a sustained concentration ratio equal to or greater than 2.

4,530,577

MOUNTING ASSEMBLY FOR SYNCHRONIZED ADJUSTMENT OF MULTIPLE MICROSCOPE HOUSING

George F. Waters, Sturbridge, Mass., assignor to Codman & Shurtleff, Inc., Randolph, Mass.

Filed Aug. 8, 1983, Ser. No. 520,956
Int. Cl.³ G02B *21/18*
U.S. Cl. 350—513 **13 Claims**



1. A mounting assembly for multiple microscope housings to permit synchronized tilting of microscope attached to said housings comprising:

a central spindle adapted for attachment to a supporting structure;

an adjusting collar operatively engaging said spindle;

means cooperatively disposed on said spindle and said collar to permit said collar to move axially of said spindle as said collar is rotated;

an adjustable bracket operatively engaging said collar to permit said adjustable bracket to move axially of said spindle together with said collar;

a plurality of tilt brackets each adapted for attachment to a microscope housing and each having a first end and a second end;

means for pivotably connecting said first end of said tilt bracket to said spindle;

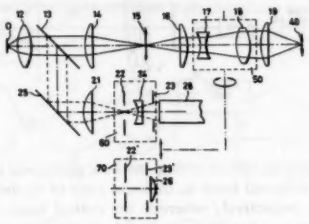
means for slidably connecting said second end of said tilt bracket to said adjustable bracket so that as said adjustable bracket and said collar move together axially along said spindle, the second end of said tilt bracket will tilt with respect to the axis of said spindle to thereby tilt said plurality of tilt brackets in synchronized fashion.

4,530,578

VARIABLE MAGNIFICATION OBSERVATION APPARATUS

Kinya Kato, Tokyo, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed May 10, 1984, Ser. No. 608,820
Claims priority, application Japan, May 16, 1983, 58-85459
Int. Cl.³ G02B *21/12, 5/14*
U.S. Cl. 350—526 **8 Claims**



1. A variable magnification observation apparatus capable of changing the magnification thereof, including:

an optical fiber having an exit surface for emitting an illuminating light beam at an angle corresponding to a predetermined numerical aperture;

an aperture stop member disposed near the exit surface of said optical fiber;

a field stop member disposed at a predetermined distance from said aperture stop member; and

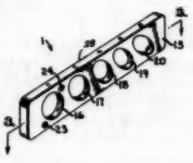
a negative lens removably inserted in the optical path between said aperture stop member and said field stop member.

4,530,579

ASTIGMATIC RULER AND METHOD OF USE THEREOF

Lawrence L. Hyde, 2900 Baltimore, Ste. 650, Kansas City, Mo. 64108

Filed Sep. 6, 1983, Ser. No. 529,485
Int. Cl.³ A61B *3/14*
U.S. Cl. 351—212 **16 Claims**



1. An instrument for the determination of the degree of astigmatism associated with an eye; said instrument comprising:

(a) a bar being suitable for manipulation by an observer above the eye for which the degree of astigmatism is to be tested;

(b) a plurality of apertures passing through said bar and adapted to have a light beam pass therethrough and into the eye to be tested; and

(c) each of said apertures being defined by respective ellipses, each having an ellipse having a different degree of ellipticity associated therewith, such that, when a major axis of the ellipse of the particular aperture associated with the astigmatism of the eye to be tested is placed above and generally perpendicular to a major axis of the cornea of the eye to be tested, a light beam passing through such particular aperture will be reflected by the

eye so as to appear as a predetermined and recognizable pattern to the observer.

4,530,580
TELESCOPIC EXTENDER FOR SUPPORTING COMPACT CAMERA

Hiroshi Ueda, 1-2-2, Nogami-Cho, Saidaiji, Nara-Shi, Nara-Ken, and Yujiro Mima, 3-4-3, Nakamachi, Asahigaoka, Sakai-Shi, Osaka-Fu, both of Japan

Filed Jan. 17, 1984, Ser. No. 571,603
Claims priority, application Japan, Jan. 18, 1983, 58-5654[U]
Int. Cl.³ G03B *17/56*
U.S. Cl. 354—82 **11 Claims**

1. A telescopic extender for supporting a compact camera, comprising:

telescopic rod means collapsible and extendable along a predetermined axis;

a grip firmly connected to one end of said telescopic rod means in a manner not to rotate relative to said telescopic rod means, said grip being capable of housing therein said telescopic rod means when said telescopic rod means is completely collapsed;

a head member firmly connected to the other end of said telescopic rod means in a manner not to rotate relative to said telescopic rod means;

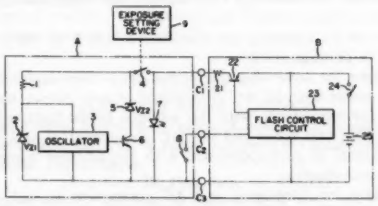
a screw member supported by said head member so as to be rotatable about an axis which is perpendicular to said predetermined axis, said screw member being fittable into a screw hole provided on a camera body for firmly attaching said head member to said camera body; and

preventing means provided on said telescopic rod means for preventing said telescopic rod means from rotating relative to said grip and head member.

4,530,581
INFORMATION DISPLAY DEVICE FOR CAMERA

Yuji Ohkubo, Ohmiya, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 476,635, Mar. 18, 1983, abandoned, which is a continuation of Ser. No. 265,999, May 21, 1981, abandoned. This application Sep. 8, 1983, Ser. No. 529,985
Claims priority, application Japan, Jun. 16, 1980, 55-81030
Int. Cl.³ G03B *15/05*
U.S. Cl. 354—127.12 **3 Claims**



1. A camera capable of a flash photography in cooperation with a flash device in accordance with an exposure time set in a range suitable to a flash light emission, said flash device generating electric energy at an electric terminal which is connected to an electric contact of the camera in a state where the flash device can emit flashlight, said camera comprising:

(a) a display element connected to said electric contact, the display element being energized when a voltage higher than a first level is applied to the display element by said electric energy;

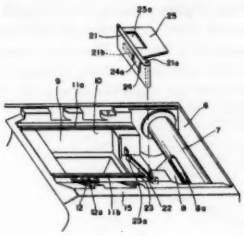
(b) control circuit means connected across said display element to control the voltage applied to said display element; and

(c) said control circuit means including oscillator means, a first constant voltage circuit for generating a voltage of a second level which is lower than said first level, by said electric energy in response to said oscillator means, switch means operable into reverse states in dependence upon whether the set exposure time is within or out of said range, the switch means being closed to connect said first constant voltage circuit across said display element, and a drive circuit which, when said switch means is closed, is connected to said electric contact to energize said oscillator means by said electric energy.

4,530,582
EXPOSURE APERTURE FRAME CONSTRUCTION FOR CAMERA

Hiroshi Hara, Tokyo; Takashi Tobioka, Saitama; Takeshi Yoshino, Saitama; Tetuo Nishikawa, Saitama, and Jiro Sekine, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 29, 1983, Ser. No. 537,423
Claims priority, application Japan, Apr. 10, 1982, 57-149807
Int. Cl.³ G03B *1/48, 19/04*
U.S. Cl. 354—203 **6 Claims**

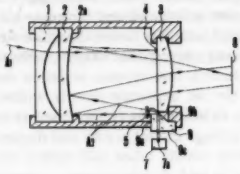


1. An exposure aperture frame structure defining an exposure aperture for a camera of the type automatically loading a film therein: said frame structure comprising at least a partition member mounted for pivotal movement about an axis perpendicular to the plane in which the film is disposed in the exposure aperture, said member forming a part of said exposure aperture frame which is pivoted about said axis by a film leader and guide means provided at one side of said partition member which has an inclined surface for causing the forward end of said film leader to ride across said parition member, pivotal movement of said partition member being caused by and thereby permitting advancement of said film leader to a film take-up chamber wherein a film is wound automatically onto a film take-up spool.

4,530,583
DISPLAY DEVICE FOR VIEW FINDER

Yasuyuki Yamada, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 279,221, Jun. 30, 1981, abandoned.
This application Mar. 3, 1983, Ser. No. 471,720
Claims priority, application Japan, Jul. 2, 1980, 55-93767[U]
Int. Cl.³ G03B *13/08, 17/20*
U.S. Cl. 354—224 1 Claim



1. A display device within a view finder of a camera, comprising:

an albada finder optics, having an objective lens and an eyepiece lens, with a semi-trasparent reflective film applied on the side of the objective lens opposite to the eyepiece lens;

a display portion provided between said objective lens and the eyepiece lens for making a display within a view finder field of vision;

an illumination light source provided outside of an effective light beam of said finder optics; and

an illumination light leading body consisting of a prism having a light incident surface, a light emitting surface and a light reflecting surface, said light incident surface being flat and said light emitting surface having a converging refractive force, said illumination light leading body being arranged on the eyepiece lens side of the display portion with said light incident surface being opposed to the illumination light source and said light emitting surface being closely opposed to the display portion, so that the light beam from the illumination light source is incident on the light incident surface, reflected by the light reflecting surface and emitting through the light emitted surface to illuminate the display portion, and the light beam from the display portion is led to the objective lens, reflected by the semi-transparent reflective film and enters the eyepiece lens, said light emitting surface placing the illuminating light source and the pupil position in an optically conjugate relation.

4,530,584
CAMERA SUPPORT

John D. Schmidt, 1634 Overbrook Rd., Englewood, Fla. 33533

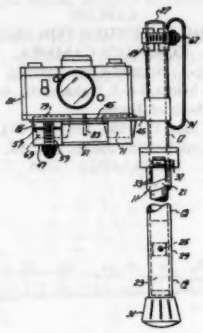
Continuation-in-part of Ser. No. 426,262, Sep. 29, 1982, Pat. No. 4,496,288. This application Feb. 2, 1983, Ser. No. 462,808
The portion of the term of this patent subsequent to Jan. 29, 2002, has been disclaimed.
Int. Cl.³ G03B *17/00*
U.S. Cl. 354—293 19 Claims

11. A camera support comprising:

(a) a base member having means thereon for supporting a camera;

(b) means on said base member for slidably receiving an elongate member in such a manner that said base member is carried by said elongate member; and

(c) means on said base member for releasably arresting and for securing said base member at selected positions along said elongate member; wherein said base member is angle-

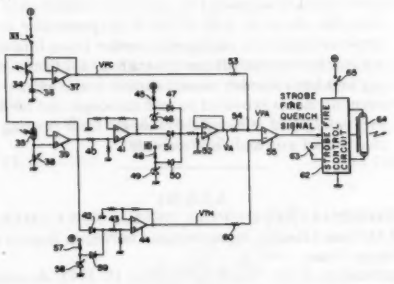


shaped such as to form a pair of legs and each of said legs has means for slidably receiving said elongate member.

4,530,585
AUTOMATIC STROBE APPARATUS

Masaharu Kanai, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 7, 1983, Ser. No. 541,077
Claims priority, application Japan, Oct. 8, 1982, 57-176233
Int. Cl.³ G03B *15/05*
U.S. Cl. 354—416 6 Claims



6. An automatic strobe apparatus used with a shutter of the type controlled in a programmed mode of operation wherein aperture size is automatically adjusted in correspondence with the conditions of ambient scene illumination light level and for automatically controlling the amount of artificial light produced by the discharge tube thereof, said apparatus comprising:

means for detecting the illumination light from the scene to be photographed;

means for separating the output signal from said detecting means into the AC component of said output signal in correspondence with the artificial strobe light reflected from said scene and the DC component of said output signal in correspondence with the ambient scene light individually;

means for integrating said AC component of said output signal in synchronism with the commencement of the strobe firing to provide a first signal;

means for receiving said DC component of said output signal so as to provide a second signal in correspondence with the ambient scene light contributive to a film exposure;

means for summing said first and second signal to provide a third signals;

means for receiving said DC component of said output signal so as to provide a fourth signal in correspondence with the aperture size of said programmed shutter;

means for comparing said third signal with said fourth signal to provide a strobe fire quench signal when a predetermined relationship between the two is established; and

means for terminating said discharge tube firing upon receiving said strobe fire quench signal.

4,530,586

APPARATUS FOR THE SETTING OF EXPOSURE CONTROL MODE IN CAMERA

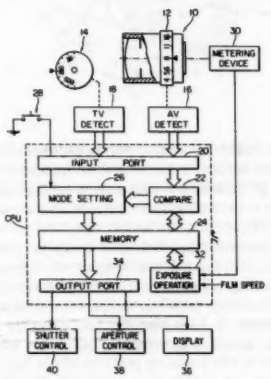
Hidehiro Ogawa, Tokyo, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Aug. 7, 1984, Ser. No. 638,409

Claims priority, application Japan, Aug. 11, 1983, 58-147141

Int. Cl.³ G03B 7/08

U.S. Cl. 354—442 **6 Claims**



1. In a camera provided with plural exposure control modes including aperture priority mode in which a time value is automatically set in accordance with an aperture value manually preset and shutter speed priority mode in which an aperture value is automatically set in accordance with a preset time value, a system for setting an exposure control mode comprising:

(a) aperture-presetting means to be operated to select an aperture value among different values;

(b) shutter speed-presetting means to be operated to select a time value among different values; and

(c) mode-setting means for selecting the aperture priority mode when said aperture-setting means is operated latest in time among said aperture-presetting means and said shutter speed-presetting means and selecting the shutter speed priority mode when said shutter speed-presetting means is operated latest.

4,530,587

STEP TYPE MASK ALIGNER

Masao Kosugi, Yokohama; Tadashi Konuki, Tokyo, and Kazuo Iizuka, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 28, 1983, Ser. No. 555,525

Claims priority, application Japan, Dec. 1, 1982, 57-210988

Int. Cl.³ G03B 27/42

U.S. Cl. 355—53 **11 Claims**

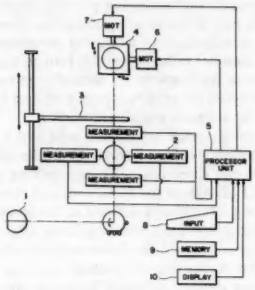
1. An exposure apparatus, comprising:

means for producing relative stepping movement between a mask and a radiation sensitive member;

means for providing a first signal relating to an arrangement of plural chip patterns of the mask for one shot for exposing the radiation sensitive member to the chip patterns;

means for providing a second signal relating to a dimension of one chip pattern;

means for providing a third signal relating to a dimension of the radiation sensitive member;



means for selecting a shot arrangement from plural possible shot arrangements on the basis of the first, second and third signals; and

means for controlling said relative stepping movement producing means in accordance with the selected shot arrangement.

4,530,588

MOUNT FOR A ROTATING DRUM AND A DEVELOPER WITHIN AN ELECTROSTATIC COPYING APPARATUS

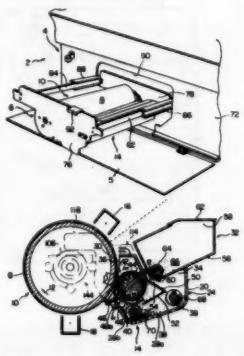
Hiroshi Kimura, Habikino; Masahiko Hisajima; Kiyoshi Shibata, both of Osaka; Yoichiro Irie, Suita; Kiyoshi Morimoto, Osaka; Takashi Nagashima, Sakai; Yasuhiko Yoshikawa; Masahiro Watashi, both of Ikoma; Kiyonori Yamamoto, Neyagawa; Toshihiko Yamamoto, Takaishi, and Shinsuke Yoshinaga, Sakai, all of Japan, assignors to Mita Industrial Co., Ltd., Japan

Filed Mar. 15, 1983, Ser. No. 475,671

Claims priority, application Japan, Apr. 19, 1982, 57-63863

Int. Cl.³ G03G 15/00, 21/00, 15/30

U.S. Cl. 355—3 DR **6 Claims**



1. In an electrostatic copying apparatus of the type including a support frame having a front support wall and a rear support wall positioned with a predetermined space therebetween in the front and rear direction, said support frame being mounted on a housing for the apparatus so that the support frame is slidable in the front and rear direction of the frame between an

operating position within the housing and a pull-out position outside of the housing, a rotating drum mounted on said support frame and having a photosensitive member disposed on the drum peripheral surface, and a developing device for developing a latent electrostatic image formed on the photosensitive member; the improvement wherein:

each of the rear surface of the front support wall and the front surface of the rear support wall in the support frame has a semicircular receiving portion having an open top, and each end of the rotating drum has mounted thereon a bearing member having a circular peripheral surface, each bearing member being insertable into an associated receiving portion from above to rotatably mount the rotating drum between the front support wall and the rear support wall of the support frame, and

the developing device has a front wall and a rear wall positioned with a predetermined space therebetween in the front and rear direction, with a projecting portion formed at the end of each of the front wall and the rear wall, with an abutting lower edge defined at the lower edge of each projecting portion, an abutting front edge defined at the front edge of each of the front wall and the rear wall and below the respective projecting portion, and with the developing device mounted between the front support wall and the rear support wall with each abutting lower edge abutting against the upper surface of the associated bearing member when said associated bearing member is inserted into its associated receiving portion, and with each abutting front edge abutting against the side surface of the associated receiving portion, whereby each bearing member is prevented from moving away upwardly from its associated receiving portion and the developing device is held at a predetermined position with respect to the rotating drum.

4,530,589

XEROGRAPHIC COPYING APPARATUS HAVING MEANS TO REDUCE CONTAMINATION OF OPTICAL COMPONENTS

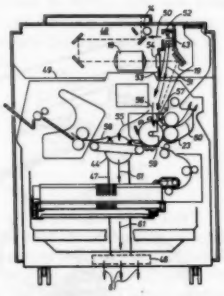
John N. Adams, Knebworth, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 20, 1983, Ser. No. 534,043

Claims priority, application United Kingdom, Sep. 21, 1982, 8226846

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 R **4 Claims**



1. Xerographic copying apparatus including an optical system for forming an optical image of an object to be copied on an electrically charged photoconductive surface, the optical image forming a corresponding electrostatic latent image on the surface, and means to develop the latent image with a particulate toner material, at least part of the optical system being housed in a substantially closed compartment, with imaging rays being directed out of the compartment in a generally horizontal direction through a substantially vertical transparent window in said compartment, said apparatus further including means to blow a curtain of air generally downwardly over the surface of said window outside the compartment.

4,530,590

IMAGE SCANNING SYSTEM HAVING A REVERSIBLY ROTATABLE SUB-SCANNING DRUM

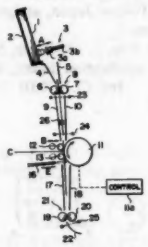
Yasuhiro Kawai, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 3, 1983, Ser. No. 491,003

Claims priority, application Japan, May 12, 1982, 57-79635

Int. Cl.³ G03G *21/00, 15/30*

U.S. Cl. 355—8 **4 Claims**



1. An image scanning system for two-dimensionally scanning a light beam across a recording sheet material comprising: a sub-scanning drum which is rotatable in both a regular direction for feeding a recording sheet material in the sub-scanning direction and the reverse direction opposite to the regular direction, the sub-scanning direction being perpendicular to the rotational axis of the sub-scanning drum; a main scanning system for scanning a light beam across the recording sheet material in a direction parallel to the rotational axis of the sub-scanning drum; at least one nip roll movable between a first position in which it is pressed against the sub-scanning drum at a part near the scanning position of the light beam and a second position in which it is removed therefrom; sheet feeding means for feeding the recording sheet material between the sub-scanning drum and the nip roll with the recording sheet material being unrestrained; a stopper which is disposed downstream of the sub-scanning drum and the nip roll with respect to the feeding path of the recording sheet material and is movable into and away from the feeding path; sheet discharging means for discharging the recording sheet material; and drum controlling means which controls rotation of the sub-scanning drum to select the position of the recording sheet material with respect to the scanning position of the light beam upon initiation of the scanning so that the scanning is started from a desired position on the recording sheet material; said sheet discharging means being arranged so as not to act on the recording sheet material to be discharged until the scanning of the recording sheet material is completed.

4,530,591

ORIGINAL CONVEYING APPARATUS FOR COPYING MACHINE

Takashi Mastuyama, Hachioji, and Kazuo Noda, Tokyo, both of Japan, assignors to Olympus Optical Company Ltd., Tokyo, Japan

Filed Apr. 13, 1983, Ser. No. 484,540

Claims priority, application Japan, Jun. 3, 1982, 57-94060

Int. Cl.³ G03G *15/28*

U.S. Cl. 355—8 **11 Claims**

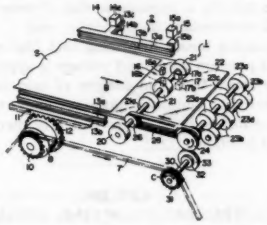
1. An original conveying apparatus for a copying machine, comprising:

a receptacle for placing an original in the form of a thick material thereon, the receptacle being normally maintained at its home position and adapted to be driven by a

reciprocatory mechanism to undergo a reciprocatory movement along a linear path with a thick material placed thereon for effecting an exposure process whenever a copying from the thick material is desired;

a first drive system disposed with the copying machine for transmitting driving power to the reciprocatory mechanism when copying from a thick material;

a sheet original drive formed integrally with the receptacle and adapted to be driven by a second drive system disposed within the copying machine to convey an original in the form of a sheet for effecting an exposure process whenever it is desired to produce a copy from a sheet original;



and means coupled between the first drive means and the reciprocatory mechanism for selectively deactuating the reciprocatory mechanism associated with the receptable while enabling the first drive means to transmit a driving power to the sheet original drive through the second drive means and a one-way drive mechanism when copying from a sheet original, a conveying of the sheet original by the sheet original drive occurring with the receptacle maintained at its home position, and a conveying of the thick material being achieved by a reciprocatory movement of the receptacle starting from the home position.

4,530,592

REGISTRATION MECHANISM FOR A MULTIMAGNIFICATION REPRODUCTION APPARATUS

Frederick A. Green, Fairport, and Frederick A. Seedhouse, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 21, 1983, Ser. No. 477,557

Int. Cl.³ G03G *15/00*; G03B *27/72*, *27/52*

U.S. Cl. 355—11 **2 Claims**

1. An imaging system for providing, at an image plane, reduced and enlarged images of a document lying in an object plane comprising:

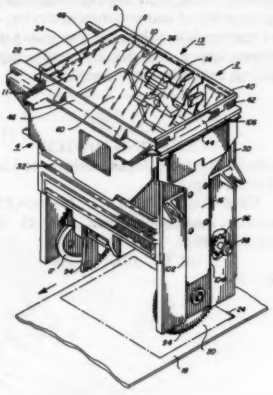
an enclosed light housing which includes a vertically translatable transparent platen assembly forming the top surface thereof and a vertically translatable floor assembly forming the bottom surface thereof,

a projection lens mounted in an aperture of said floor assembly,

means for simultaneously changing the position of said platen assembly and said floor assembly in response to a particular magnification selection,

flash illumination means within said housing to provide substantially uniform illumination of said platen; and

lens registration means for providing a horizontal component of motion to said lens simultaneously with said vertical lens movement to maintain corner registration of said document at the imaging plane including a horizontal lens carriage having the lens mounted thereon, and



cable drive means adapted to drive said lens carriage in a horizontal direction so as to change the position of said lens in said floor assembly aperture.

4,530,593

IMAGE FORMING APPARATUS WITH ATTACHMENT

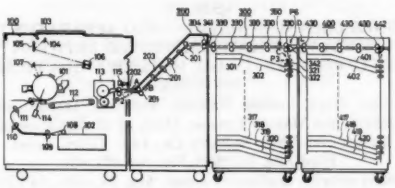
Yukio Kasuya, Tokyo; Toshiaki Yagasaki, Hino, and Shunichi Masuda, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Toyko, Japan

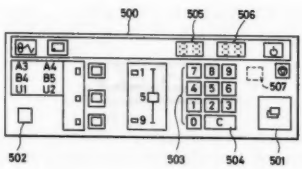
Continuation of Ser. No. 367,724, Apr. 12, 1982, abandoned. This application Apr. 6, 1984, Ser. No. 597,563

Claims priority, application Japan, Apr. 17, 1981, 56-57218; May 13, 1981, 56-70626; May 13, 1981, 56-70627

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 R **12 Claims**





1. An image forming apparatus with attachment comprising:

image forming means for forming an image on a recording sheet;

display means for displaying a number relating to said image formation;

an attachment device for performing a predetermined processing of the recording sheets transported after image formation by said image forming means; and

control means for controlling said display means such that in case the number of recording sheets upon which an image is to be formed exceeds the processing capacity of said attachment device, said display means displays the processing capacity of said attachment device, and in case the desired number is less than the processing capacity of said attachment device, said display means displays the number relating to the image formation.

4,530,594

CLEANING DEVICE

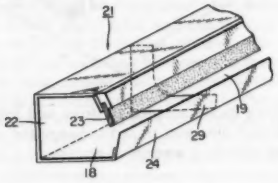
Hiroyuki Adachi, Hachioji, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1983, Ser. No. 494,525

Claims priority, application Japan, May 21, 1982, 57-86327; Jul. 13, 1982, 57-121823

Int. Cl.³ G03G *15/08*

U.S. Cl. 355—15 **10 Claims**



1. A cleaning device comprising:

a cleaning member in contact with a surface of a member to be cleaned by removing developer thereon;

a recovery container for recovering the developer removed by said cleaning member; and

a partition member provided in the recovery container so as to divide the interior of the recovery container into plural recovery spaces and thereby limit the movement of the developer recovered therein.

4,530,595

TONER CLEANING METHOD AND APPARATUS IN WHICH VOLTAGE IS IMPRESSED BETWEEN ELECTROSTATIC IMAGE HOLDER AND A FILM MEMBER

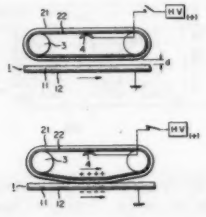
Masahiko Itaya; Satoshi Haneda; Noriyoshi Tarumi, all of Hachioji, and Makoto Tomono, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 13, 1982, Ser. No. 407,920

Claims priority, application Japan, Aug. 24, 1981, 56-133201

Int. Cl.³ G03G *21/00*

U.S. Cl. 355—15 **26 Claims**



13. A toner cleaning apparatus for cleaning toner from the surface of a movable electrostatic image holder, comprising:

a flexible endless belt-type film member comprising an insulating layer and a conductive layer inside said insulating layer, said endless film member being rotatably mounted, said film member being positioned so that at least a part thereof faces a surface of said electrostatic image holder;

displacing means coupled to said film member for selectively displacing said film member from a first position whereat insulating layer of said film member is close to but spaced from and facing said electrostatic image holder to a second position whereat at least a surface portion of said insulating layer of said film member faces and is in contact with the surface of said electrostatic image holder;

voltage supply means including an electrode member coupled to said film member for applying a voltage between said electrostatic mage holder and said conductive layer of said film member when said film member is at said second position, said applied voltage being a D.C. voltage whose polarity is opposite to that of toner on the surface of said electrostatic image holder; and

said displacing means displacing said film member to said second position when said voltage is applied;

whereby toner from the surface of said image holder is transferred to said insulating layer under the influence of said applied voltage when said film member is at said second position.

4,530,596

ELECTROSTATIC COPYING APPARATUS

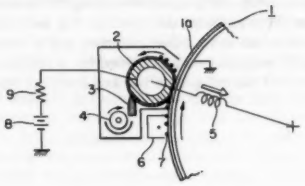
Kiyoaki Kawamoto; Kastuhiro Shukuri; Takayoshi Hashimoto; Yoshio Yamazaki, and Shigeru Inowa, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Feb. 9, 1983, Ser. No. 465,325

Claims priority, application Japan, Feb. 17, 1982, 57-25047

Int. Cl.³ G03G *21/00*

U.S. Cl. 355—15 **21 Claims**



1. In an electrostatic copying apparatus, a cleaning system comprising a cleaning roller being in contact with a moving toner supporting member and rotating in the direction of movement of said toner supporting member, for removing residual toner held by electric charge on said toner supporting member, the improvement comprising means for impressing on said cleaning roller a bias voltage whose polarity is opposite to that of an electric charge held by said residual toner and said cleaning roller comprising an axle, a conductive elastic layer formed around said axle, and a thin porous film formed as an outermost layer over said elastic layer.

4,530,597

BRUSH CLEANING DEVICE

Masahiko Itaya, and Satoshi Haneda, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Feb. 9, 1983, Ser. No. 465,422

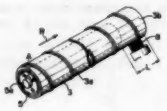
Claims priority, application Japan, Feb. 15, 1982, 57-23200; Feb. 15, 1982, 57-18563[U]; Feb. 15, 1982, 57-20333[U]

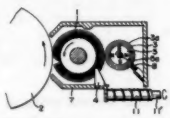
Int. Cl.³ G03G *21/00*

U.S. Cl. 355—15 **14 Claims**

1. A brush cleaning device for electrophotographic reproducing apparatus, comprising: a fur brush for removing magnetic toner remaining on an image receptor after the image transfer process; a nonmagnetic cylindrical sleeve disposed

near the fur brush; a magnetic member disposed inside the cylindrical sleeve to attract the toner onto the surface of the sleeve, whereby at least one of the cylindrical sleeve and the magnetic member is made to rotate; and a spiral projection





formed on the surface of the sleeve for moving in an axial direction of the sleeve the magnetic toner slidingly or rotatably thereon by the rotation of said cylindrical sleeve or magnetic member.

4,530,598

ELECTROSTATIC COPYING APPARATUS

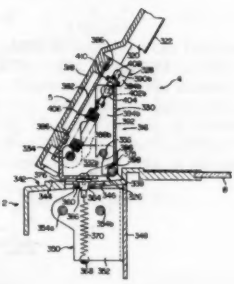
Hiroshi Kajita, Kobe; Masahide Iseki, Neyagawa; Tadanobu Nakajima, Sakurai, and Yoshizo Kawamori, Fujiidera, all of Japan, assignors to Mita Industrial Co., Ltd., Japan

Division of Ser. No. 361,238, Mar. 24, 1982, Pat. No. 4,465,272. This application Apr. 4, 1984, Ser. No. 596,331

Claims priority, application Japan, Mar. 31, 1981, 56-47874; Mar. 31, 1981, 56-47875

Int. Cl.[3] G03B *27/62*

U.S. Cl. 355—75 **10 Claims**



1. In a document holding device for an electrostatic copying apparatus, said holding device comprising a holding member for holding a document to be copied and a mounting mechanism for mounting the document holding member on a supporting base portion for free turning about a pivot axis extending along one side edge of a transparent plate on which the document is to be placed, said supporting base portion being located adjacent to said one side edge of the transparent plate; the improvement wherein the mounting mechanism includes a support member mounted on said supporting base portion such that it is free to move upwardly and downwardly and to swing in the direction of said pivot axis, and the document holding member is mounted on said support member for free turning about said pivot axis.

4,530,599

PHOTOGRAPHIC PRINTER

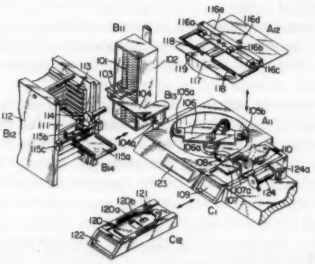
Hisayuki Kaizuma, and Haruo Hakamada, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 29, 1983, Ser. No. 527,342

Claims priority, application Japan, Aug. 30, 1982, 57-149207; Aug. 30, 1982, 57-149208; Sep. 21, 1982, 57-163232; Sep. 21, 1982, 57-163233

Int. Cl.[3] G03B *27/62, 27/52*

U.S. Cl. 355—75 **6 Claims**



1. A photographic printer comprising a negative film-supply-and-transport mechanism having both means to supply and transport 135-size films to their printing section and means to supply and transport disc films to its printing section which are interchangeable with each other, wherein said means to supply and transport disc films comprises a disc film supplying section containing a plurality of disc films wherefrom the disc films are transported automatically to the printing section therefor through a transporting section of said means to supply and transport disc films.

4,530,600

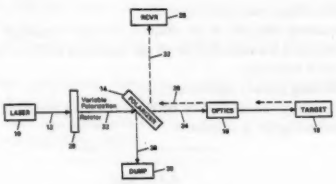
VARIABLE ATTENUATOR FOR OPTICAL TRANSCEIVER

Marco A. Lopez, Anaheim, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Feb. 22, 1982, Ser. No. 351,028

Int. Cl.[3] G01C *3/08*

U.S. Cl. 356—5 **1 Claim**



1. An optical transceiver arrangement for transmitting light toward a target and for receiving light from the target, and for controlling the intensity of the light transmitted toward the target, comprising:

a light source for generating coherent polarized light along a first optical path;

beam splitter means comprising a polarizer positioned in the first optical path for intercepting light generated from said coherent polarized light source, and for splitting the intercepted light into a first component beam for transmission in the direction of a target along a second polarized optical path, and into a second component beam for transmission

along a third polarized optical path orthogonal to said first component beam in said second optical path;

absorbing means positioned to intercept the beam of said third optical path for absorbing the light therein and for converting and dissipating such light in the form of heat;

collimating optical means located within said second optical path for collimating the beam from said beam splitter means and for directing said beam onto said target, and for collecting and directing a component portion of light reflected by the target back along said second optical path and onto said beam splitter means for deflecting said reflected beam from said target into a fourth optical path orthogonal to said second optical path;

beam detection means located in said fourth optical path for detecting the intensity of the component beam reflected from said target and deflected by said beam splitter means; and

adjustably rotatable polarization altering means positioned in the first optical path between the light source and the beam splitter means, for rotating by a controllable amount the polariztion of light passing therethrough, thereby controlling the relative intensities of the component beams of the light intercepted by the beam splitter means and of that light transmitted along said second optical path thereby reducing controllably the intensity of the light directed toward the target without further attenuation of the intensity of the light received by said beam detection means through said optical means.

4,530,601

QUANTITATIVE TEST FOR RESIDUAL ROSIN ON CLEANED CIRCUIT BOARDS

Emmett L. Tasset, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 24, 1983, Ser. No. 544,346
Int. Cl.³ C09K *3/00*; G01N *21/32, 1/00*
U.S. Cl. 356—36 **5 Claims**

1. A method for determining the cleanliness of an electronics circuit board following solder flux removal procedures which comprises washing both major surfaces of said board with a measured quantity of a test solvent selected from the group consisting of isopropanol, acetonitrile, or an aqueous solution thereof containing greater than 50% by volume of one of said solvents, said board previously having been washed with a rosin flux removal composition to remove said flux after soldering the circuitry of said board, said measured quantity being at least about 1 milliliter of said test solvent per square inch of board surface, excluding edges,

collecting said washings,

adjusting the pH of an aliquot of said washings to between about 1 to about 3 with an aqueous 0.05 to 1N aqueous acid solution,

agitating gently said mixture,

measuring the turbidity of the resulting solution, and

comparing to a standard.

4,530,602

INTERFACE ALIGNMENT SYSTEM

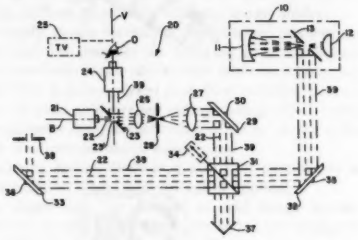
Patrick J. Pomphrey, Jr., Huntington Beach, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 29, 1983, Ser. No. 480,156
Int. Cl.³ G01B *11/26*
U.S. Cl. 356—138 **8 Claims**

1. An optical system for detecting misalignment of the optical components of a high energy laser having an unstable resonator including a scraper mirror and an optical train for directing a high energy laser beam along an optical axis to a target, comprising:

a. a source of radiation providing an alignment beam, said source positioned to direct said beam along a beam axis perpendicular to and intersecting said optical axis of said high energy laser;

b. optical beam splitting means, disposed at the intersection of said alignment beam axis and said optical axis, for directing a first portion of said alignment beam along said optical axis to said target, and for directing a second portion of said alignment beam along said optical path to



said resonator, said second portion interacting with said resonator to provide a return beam from said resonator along said optical path and said beam axis toward said radiation source; and

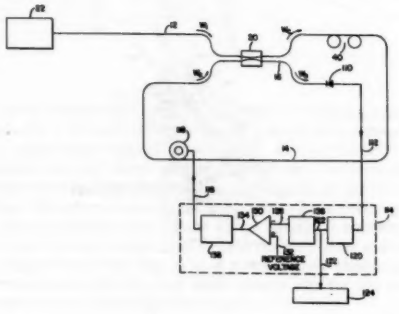
c. means, disposed along said alignment beam axis intermediate said source and said beam splitting means, for displaying said return beam relative to said alignment beam axis.

4,530,603

STABILIZED FIBER OPTIC SENSOR

Herbert J. Shaw; Marvin Chodorow, both of Stanford, and Loren F. Stokes, Palo Alto, all of Calif., assignors to The Board of Trustees of Leland Stanford Jr. Univ., Stanford, Calif.

Filed Sep. 29, 1982, Ser. No. 426,887
Int. Cl.³ G01B *9/02*
U.S. Cl. 356—345 **21 Claims**



11. A method of sensing acoustic waves utilizing an optical fiber, said method comprising:

forming a loop in said fiber;

applying input light for propagation through said loop to provide an optical output signal;

using a fiber optic coupler to optically close said loop;

selecting the length of said loop to provide a resonant cavity, said loop length affecting the intensity of said output signal;

compensating for thermally induced loop length changes to stabilize said output signal intensity against said thermally induced changes; and

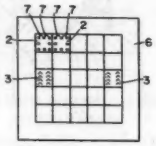
detecting said output signal to sense the presence of said acoustic waves.

4,530,604

METHOD OF ALIGNING A MASK AND A WAFER FOR MANUFACTURING SEMICONDUCTOR CIRCUIT ELEMENTS

Kazuhisa Okutsu; Katsumi Momose, and Ryozo Hiraga, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 42,236, May 24, 1979, abandoned. This application Aug. 8, 1983, Ser. No. 521,016
Claims priority, application Japan, Jun. 1, 1978, 53-66400
Int. Cl.³ G01N *21/30*
U.S. Cl. 356—401 **1 Claim**



1. A method of aligning wafers of the same type successively supported for relative parallel movement with respect to a mask, comprising the steps of:

effecting rough alignment by using relatively large alignment marks provided on the mask and a first wafer;

effecting fine alignment by using key patterns provided on said mask and said first wafer and having substantially no positional deviation with respect to actual element patterns;

memorizing the amount of the fine alignment;

supplying a second wafer of the same type as said first wafer instead of said first wafer;

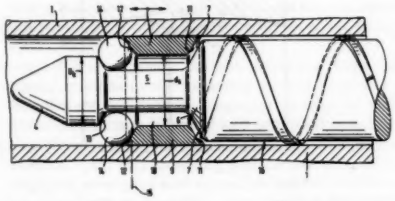
effecting rough alignment by using relatively large alignment marks provided on said mask and said second wafer; and moving one of said roughly aligned mask and second wafer relative and parallel to the other correspondingly to the amount of said fine alignment.

4,530,605

CHECK VALVE ARRANGEMENT FOR THE DISCHARGE END OF AN EXTRUDER, PLASTIFIER OR THE LIKE

Martin Eichlseder, Tettenweis, and Erwin Bürkle, Benediktbeuern, both of Fed. Rep. of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 20, 1983, Ser. No. 563,696
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1982, 3247272
Int. Cl.³ B29F *1/02*
U.S. Cl. 366—79 **6 Claims**



1. The combination with a plastifying worm in a plastifying cylinder for plastifying a synthetic resin and displacing it in a direction past an end of said worm, of a backflow preventing valve formed on said end of said worm, said valve comprising:

a valve seat formed by an upstream surface, a neck extending from said upstream surface in a downstream direction, and a tip mounted on said neck and having a downstream surface turned toward said upstream surface;

a valving ring disposed between said surfaces and engageable with said seat while surrounding said neck with clearance to define a flow passage for said resin between said neck and said ring; and

spacer means between said ring and said downstream surface, said downstream surface and a confronting complementary surface of said ring being shaped to enable radial removal of said spacer means upon the emergence of said valve from said sealing, said ring having an inner diameter greater than the outer diameter of said tip, said spacer means comprising a plurlaity of balls received between said downstream surface and said complementary surface of said ring, said downstream surface and said complementary surface being frustoconical and diverging outwardly from said axis to a downstream direction, said downstream surface, said neck, said complementary surface and said cylinder being so dimensioned that said balls bear radially directly against said cylinder and said downstream and complementary surfaces being substantially parallel.

4,530,606

APPARATUS FOR STIRRING SOLUTIONS IN SMALL VESSELS

Thomas R. Hopkins, and Linda L. Hopkins, both of 3417 Willowood Dr., Bartlesville, Okla. 74006

Filed Sep. 30, 1982, Ser. No. 429,151
Int. Cl.³ B01F *7/28*
U.S. Cl. 366—129 **6 Claims**

1. A stirring apparatus comprising:

(a) an electrically powered drive device having a rotable drive shaft;

(b) connecting means fixedly mounted on said drive shaft; and

(c) a hollow, polymeric, tubular agitating shaft being fixedly attached at one end to said drive shaft by said connecting means, said agitating shaft being open at the end not attached to said drive shaft.

4,530,607

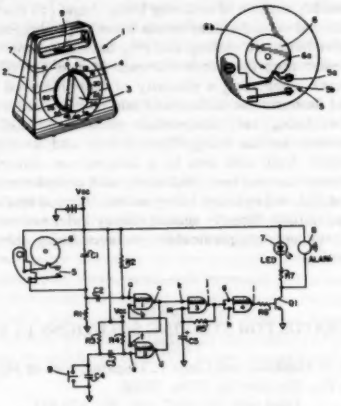
ALARM AND RESET CIRCUIT FOR A COUNTDOWN TIMER

John H. Bungener, Glenview, Ill., assignor to Pelouze Scale Company, Evanston, Ill.

Filed Aug. 10, 1984, Ser. No. 639,505
Int. Cl.³ G04F *8/00*
U.S. Cl. 368—109 **7 Claims**

1. In a battery-powered alarm and reset circuit for an electromechanical countdown timing mechanism which drives a set of cam-actuated main contacts to render both a visual alarm and an audible alarm at zero countdown time, the improvement comprising a digital logic circuit to which battery voltage is continuously applied during timer standby conditions including a digital gate having an output to input feedback

circuit which places the digital gate into an oscillatory state to generate a low-frequency pulsing output signal which activates both the visual alarm and the audible alarm, means including the cam-actuated main contacts in a predetermined circuit condition for applying a first set of input voltages to the input of the digital gate which places the digital gate into an oscillatory condition to activate both alarms, and a reset circuit including a reset switch which closes and remains closed only during the application of a momentary manual closing force which applies a second set of input voltages to the input of said digital gate which removes the digital gate from its oscillatory state to thereby terminate both alarms and return the digital logic circuit to timer standby conditions.

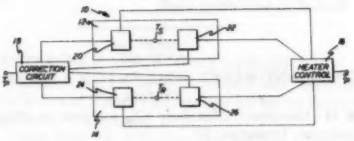


4,530,608

BASELINE CONTROL FOR A DIFFERENTIAL SCANNING CALORIMETER

Michael J. O'Neill, Wilton, Conn., assignor to The Perkin-Elmer Corp., Norwalk, Conn.

Filed May 14, 1984, Ser. No. 609,630
Int. Cl.³ G01K *17/04*
U.S. Cl. 374—11 **5 Claims**



1. A differential scanning calorimeter correction control apparatus; said apparatus comprising:

a sample holder and a reference holder, each said holder having a heater element and a sensor element associated therewith; and

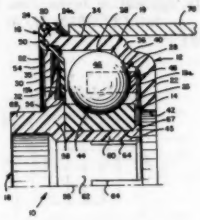
means for simultaneously compensating for both linear and curvilinear heat flow variations between said sample holder and said reference holder.

4,530,609

CONVEYOR ROLL BEARING

Philip D. Jasperse, Zeeland; Siegfried K. Weis, Conklin, and Milo D. Sovis, Jr., Grand Haven, all of Mich., assignors to FROCEMCO, Inc., Grand Rapids, Mich.

Filed Aug. 3, 1983, Ser. No. 520,113
Int. Cl.³ F16C *33/78*
U.S. Cl. 384—482 **10 Claims**



1. A bearing comprising:

a cup-shaped outer race means for receiving a complement of rolling elements, said outer race means including an outer wall portion terminating in a rim portion extending radially outwardly from said outer wall, said outer race means further including an end wall portion extending radially inwardly from said outer wall portion;

an inner race means for defining a raceway together with said outer race means;

a plurality of rolling elements within said raceway;

an end cap crimpingly secured to said rim portion of said outer race means, said end cap including a peripheral crimp portion crimped about said rim portion, said end cap including a load bearing thrust support portion extending radially inwardly from said peripheral portion to provide lateral support for said rolling elements; and

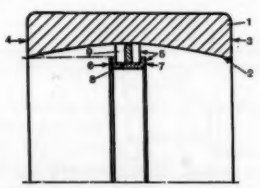
an electrically conductive hub member supporting said inner race member, said hub member including an annular sealing portion contacting said end cap to seal said raceway, said hub member comprising a polymer filled with an electrically conductive material.

4,530,610

MULTIPLE-ROW ROLLER BEARING WITH A GUIDING RING

Hakan Stackling, Askim, Sweden, assignor to Aktiebolaget SKF, Gothenburg, Sweden

Filed Oct. 24, 1983, Ser. No. 544,793
Claims priority, application Sweden, Dec. 13, 1982, 8207114
Int. Cl.³ F16C *33/51*
U.S. Cl. 384—560 **6 Claims**



1. A multiple-row roller bearing including an outer ring having a spherical raceway wherein the diameter adjacent the axial end faces (3, 4) of the outer ring is greater than the diameter at the axial end faces, a guide ring assembly mounted between adjacent rows of rollers having means for centering the guide ring in the bearing by contact with the raceway of the outer ring and operable to guide the rollers in adjacent rows of rollers, said guide ring comprising an inner one-piece annular

member having rotational symmetry and being of a predetermined maximum diametral dimension allowing assembly of the inner annular member into the outer ring of the bearing, said inner member being made of a wear resistant material having a low coefficient of friction and an outer member mountable on the peripheral surface of the inner annular member when the inner annular member is inserted in the outer ring of the bearing, said outer member centering and filling the space between the inner annular member and the raceway of the outer ring at least in some of the areas between the inner part and the outer raceway, said inner annular member being of U-shaped cross section and having upstanding leg portions wherein the outer circumferentially extending faces are of frusto-conical configuration and confront the axial end faces of the adjacent rows of rollers.

4,530,611

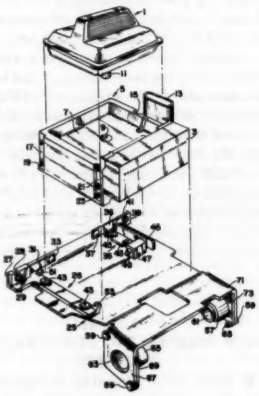
PRINTHEAD MOUNTING/DEMOUNTING MECHANISM

Frank Borcenk, Pennsburg; Jeffry A. Forsythe, Berwyn, both of Pa., and Frank L. Roe, Brookfield Center, Conn., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Mar. 31, 1983, Ser. No. 480,665

Int. Cl.³ B41J *3/04, 25/30*

U.S. Cl. 400—175 **15 Claims**



1. In a printer, the combination comprising:

a printhead assembly having front and back surfaces connected by opposite sidewalls, and including at least first and second horizontally aligned downwardly projecting chamfered surface means located on said opposite sidewalls of said assembly relative to said printhead, for providing hold-down or fastening surfaces for said assembly;

means providing a mounting surface for receiving said printhead assembly;

at least a first angularly upright projecting finger means rigidly attached to said mounting surface means at a position thereon for slideably engaging an edge of said first chamfered surface means of said printhead assembly;

spring biased wedge pin means rigidly mounted at another position upon said mounting surface means for slideably engaging an edge of said second chamfered surface means of said printhead assembly, for permitting said printhead assembly to be "snapped" into or out of captive retention upon said mounting surface means, wherein when in such captive retention, said wedge pin means both exerts a downward force upon said second chamfered surface means, and another force upon said printhead assembly for pushing said second chamfered surface means of said printhead assembly into engagement with said first finger means, causing the latter to exert a downwardly projecting force upon the former; and

leaf-spring means rigidly mounted and positioned upon said mounting surface means for applying a forward projecting force upon the back surface of said printhead assembly.

4,530,612

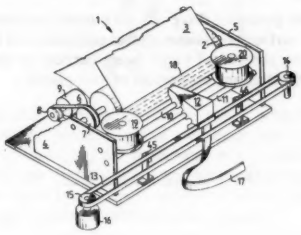
METHOD FOR ADAPTIVELY USING A PRINT RIBBON IN AN IMPACT PRINTER

William J. Butera, Korntal, Fed. Rep. of Germany, and Peter Stucki, Langnau am Albis, Switzerland, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Aug. 5, 1983, Ser. No. 520,799

Int. Cl.³ B41J *33/36, 33/56*

U.S. Cl. 400—232 **12 Claims**



1. A method for adaptively using a relatively long length of inked printing ribbon in an impact printer having a print head which moves back and forth across a platen and spooling means for longitudinally spooling the ribbon past the print head intermediate the print head and the platen, such method comprising the steps of:

repeatedly traversing the print head over one longitudinal subsection of the ribbon without any longitudinal advancement of the ribbon;

monitoring the condition of the ink in the subsection being traversed by the print head;

detecting when the condition of the ink in the monitored subsection has reached a predetermined lower tolerance level;

longitudinally advancing the ribbon when the lower tolerance level is detected and thereafter repeatedly traversing a subsequent nonoverlapping longitudinal subsection of the ribbon without any longitudinal advancement of the ribbon; and

repeating the monitoring, detecting and advancing steps until substantially the entire length of ribbon is used up.

4,530,613

DEVICE FOR MONITORING PAPER IN TYPEWRITERS AND SIMILAR MACHINES

Richard Horman, Schwabach, and Wilfried Rettke, Altdorf, both of Fed. Rep. of Germany, assignors to Triumph-Adler Aktiengesellschaft fur Buro- und Informationstechnik, Nuremberg, Fed. Rep. of Germany

Filed Apr. 30, 1984, Ser. No. 605,149

Claims priority, application Fed. Rep. of Germany, May 6, 1983, 3316580

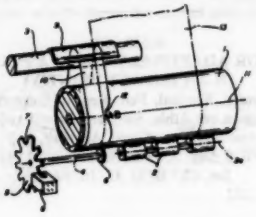
Int. Cl.³ B41J *11/64*

U.S. Cl. 400—708 **5 Claims**

1. Paper feed monitoring apparatus for a printer or the like having a frame comprising a rotatable platen and associated pressure rollers adapted to line feed paper inserted between said platen and pressure rollers incident to platen indexing,

a pulse generator having a drive roll positioned adjacent said platen to be contacted and driven by paper supported by said platen as said paper is fed by indexing of said platen, and

means stationary relative to said printer frame located adjacent one end of said platen, positioned between said platen and paper carried by said platen, and aligned with said



pulse generator drive roll, said means presenting a stationary surface at all times so that said drive roll is not rotated in the absence of paper being carried by said platen regardless of any movement of said platen.

4,530,614

FRAMEWORK MADE OF HOLLOW SECTIONS

Ewald Rüter, Bittermarkstr. 70, 4600 Dortmund 50, Fed. Rep. of Germany

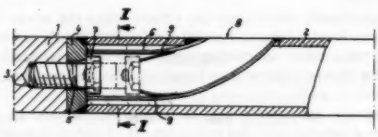
PCT No. PCT/DE82/00139, § 371 Date Mar. 10, 1983, § 102(e) Date Mar. 10, 1983, PCT Pub. No. WO83/00175, PCT Pub. Date Jan. 20, 1983

PCT Filed Jul. 6, 1982, Ser. No. 488,549

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1981, 3127243

Int. Cl.³ F16B *17/00*

U.S. Cl. 403—7 **8 Claims**



1. A framework assembly comprising at least one tubular bar element having a plate closing an end thereof, and opening in a wall of said element spaced away from said plate and a curved tubular guide received in said bar element and permanently affixed thereto to define the passage between said opening and said plate, said plate being provided with a hole aligned with said passage smaller than said passage thereby defining a shoulder on said plate;

a cap screw traversing said hole and having a head received in said passage and dimensioned to be guided by said passage from said opening for insertion of said cap screw through said hole; and

a further member threadedly engaging said cap screw externally of said plate and having an exterior flush with said plate whereby said bar element, said plate and said further member form a framework junction when said cap screw is threadedly received by said further member and said head is in engagement with said shoulder free from recesses and projections.

4,530,615

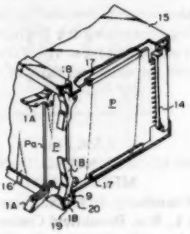
LOCKING AND RELEASING DEVICE FOR USE WITH A PANEL PLATE

Nobuo Katsuura, Yokohama, and Takashi Furusawa, Tokyo, both of Japan, assignors to Nikko Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 2, 1984, Ser. No. 627,276

Int. Cl.³ F16D *1/00*

U.S. Cl. 403—16 **4 Claims**



1. A locking and releasing device for use with a panel plate comprising a riding saddle body including a saddle seat and a pair of parallel leg plates extending in the same direction from said saddle seat to provide a gap therebetween which is at least equal to the thickness of the panel plate, each of said leg plates having an aperture bored at a portion remote from the seat, said apertures having the same diameter and being in alignment with each other, the outer surface of one of said leg plates being provided with a pin that extends from said aperture in a direction normal thereto, the outside diameter of said pin being substantially the same as the inside diameter of the apertures, the length of said pin being substantially the same as the distance between the outer surfaces of said parallel leg plates, said pin extending from one of said leg plates in a direction normal thereto in such a manner that said pin is made integral with part of the inner periphery of the aperture by means of thin film strips.

4,530,616

MEANS FOR ASSEMBLING TUBULAR SCAFFOLDING ELEMENTS

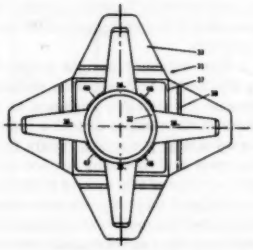
Marcel H. R. Roux, Saint Martin de Brethencourt, 78660 Ablis (Yvelines), France

Division of Ser. No. 327,694, Dec. 4, 1981,. This application Mar. 2, 1984, Ser. No. 585,434

Claims priority, application France, Dec. 4, 1980, 80 25734; Oct. 27, 1981, 81 20117

Int. Cl.³ F16B *9/02*

U.S. Cl. 403—246 **10 Claims**



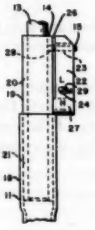
1. Means for assembling tubular vertical and horizontal elements comprising annulus (31) fixed on a vertical tubular element (32), said annulus comprising multiple radial arms (33),

at least one of said radial arms being engageable by a cap (34) joined to the end of a corresponding horizontal tubular element (42), an aperture (36) formed in said radial arm, step shaped bosses (37,38,39) formed on said radial arm adjacent said vertical tubular element and being adapted to receive the corresponding end of said cap, and said cap and said radial arm being interlocked by means of a key.

4,530,617
ASSEMBLY HAVING ADJUSTABLE TENSION FASTENER MEANS

Robert L. Hawie, Stratford, Conn., assignor to The Hawie Mfg. Co., Bridgeport, Conn.

Filed Sep. 22, 1982, Ser. No. 421,032
Int. Cl.³ F16B *2/02*
U.S. Cl. 403—290 **10 Claims**



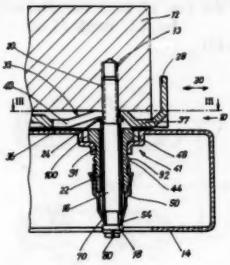
2. In an assembly comprising an elongate handle element having an axial bore and a tool element having a shank which is frictionally-engaged within said bore so as to permit separation under the effect of an axial pulling force, the improvement which comprises an adjustable tension release mechanism for increasing and decreasing the degree of frictional engagement between said tool element and said handle element, while still permitting separation during normal use, said mechanism comprising a transverse projection on one of said elements and a transverse recess for receiving said projection on the other of said elements, a longitudinal flexible finger designed to releasably press said transverse projection into said transverse recess when said elements are assembled, and adjustment means associated with said flexible finger for varying the degree of pressure between said projection and said recess to thereby adjust the degree of axial force required to pull said tool element out of engagement with said handle element while retaining the ability of said elements to separate under the effect of high axial pulling force.

4,530,618
PLUG CONNECTION SYSTEM

Kurt Stoll, Lenzhalde 72, 7300 Esslingen, Fed. Rep. of Germany

Filed Mar. 10, 1983, Ser. No. 474,065
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1982, 3209257; Dec. 13, 1982, 3246042
Int. Cl.³ F16B *21/00*
U.S. Cl. 403—322 **15 Claims**

1. A connecting device for releasably connecting a first member to a second member, comprising: a bush adapted to be fixedly secured in an opening in the first member, said bush having a central opening therethrough, having at an end nearest the second member a core portion, and having at its opposite end a further portion which has a locking jaw; a pin which is adapted to be secured to the second member, which can be axially inserted in a first direction into said opening through said bush, and which has means defining an axially facing shoulder thereon which said locking jaw can engage for releasably locking said pin against axial movement relative to said bush in a second direction opposite said first direction; a sleeve which is axially slidably supported on said pin and which, when moved axially in said first direction relative to said pin, has a first end which moves said locking jaw outwardly so as to release said pin for movement in said second direction relative to said bush, wherein said sleeve frictionally engages said pin and said core portion of said bush, the friction between said sleeve and said bush being greater than the friction between said sleeve and said pin, and an operating element which coop-

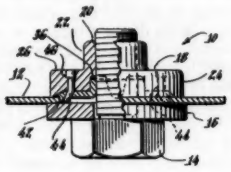


erates with a second end of said sleeve which is remote from said first end and projects out of said bush, said operating element being supported for movement in a direction transversely of said pin and having means for causing axial movement of said sleeve in said first direction relative to said pin in response to movement of said operating element.

4,530,619
SELF-RETAINING NUT AND METHOD OF APPLYING TO A PANEL

Philip D. Becker, Southbury, Conn., assignor to Buell Industries, Inc., Waterbury, Conn.

Filed Sep. 24, 1982, Ser. No. 422,538
Int. Cl.³ F16B *39/282*
U.S. Cl. 403—406 **14 Claims**



1. A nut to be secured to a panel-like member and be self-retaining thereon comprising a nut body having a first body portion and a second body portion of a diameter greater than the first, a first end surface and a second end surface, an opening between the end surfaces for receiving a threaded fastener, a shoulder surface between the first and second body portions, pin means projecting through the second body portion in the area formed by the large diameter of the second body portion and piercingly engagable with the panel-like member, the pin means projecting beyond the second end surface a distance greater than the thickness of the panel-like member to which the nut is to be secured for passing through the panel-like member to secure the nut and to prevent relative rotation, the opening having stepped bores of varying diameter therein, a first bore in the first body portion having a diameter slightly smaller than the diameter of the threaded fastener to be received, a second bore in the second body portion having a diameter greater than the diameter of the first bore by an amount sufficient to receive an extruded portion of the panel-like member therein, for engagement therewith, while allowing the threaded fastener to pass through the extruded portion, and a third bore portion located adjacent to the second end

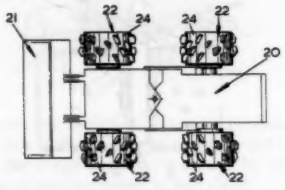
surface and extending a diameter larger than the second bore and such that the pin means pass therethrough.

4,530,620

LANDFILL COMPACTOR VEHICLES

Bernard McCartney, Stockport, England, assignor to Bernard McCartney Limited, Stockport, England

Filed Feb. 17, 1983, Ser. No. 467,580
Int. Cl.³ B60B *15/00*
U.S. Cl. 404—121 **7 Claims**



1. A landfill compactor vehicle comprising two front ground-engaging steel wheels, two rear ground-engaging steel wheels, each of said wheels having a cylindrical rim, compactor teeth of cast construction welded to and extending radially outwardly of the rim of each ground-engaging steel wheel, and each cast compactor tooth comprising at least one slicing portion integral with a tamping portion, said slicing portion extending radially outwards of the tamping portion, said slicing portion being generally of rectangular plate-like configuration with a wheel rim-remote peak, said tamping portion being of substantially pyramidal configuration extending from a face of said slicing portion, said compactor teeth of each wheel being arranged around the rim thereof in a twin helical pattern with slicing portions thereof lying at an acute angle to the direction of rotation of the wheel, the wheels being fitted onto the landfill compactor vehicle with the slicing portions of the compactor teeth of the two front wheels leading the tamping portions thereof, in terms of the direction of wheel rotation, the tamping portions of the two rear wheels lead the slicing portions thereof, in terms of the direction of wheel rotation, and the slicing portions of the teeth of one front wheel and its opposite rear wheel lying in the same or parallel planes while the slicing portions of the teeth of the other front wheel and its opposite rear wheel lie in the same or parallel planes normal to the first-mentioned planes; whereby, the front wheel teeth have an inboard "screwing" action on the refuse or waste, while the rear wheel teeth have an outboard "screwing" action, or vice versa, depending upon the direction of vehicle travel.

4,530,621

SHIELD DRIVING PROCESS FOR ENLARGEMENT

Toshio Furuta; Nobuhiko Kawamoto, and Akira Honma, all of Tokyo, Japan, assignors to Mitsui Kensetsu Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1983, Ser. No. 558,973
Claims priority, application Japan, Dec. 8, 1982, 57-215322
Int. Cl.³ E21D *11/00, 9/06*
U.S. Cl. 405—150 **7 Claims**

1. A shield driving process for enlarging the periphery of a predetermined region of an existing tunnel lined with a primary shield segment assembly comprising the following steps:

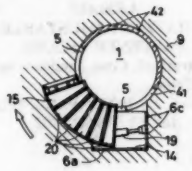
removing some segments of a region of a primary shield segment assembly that correspond to the predetermined region to be enlarged in series along the axial direction of the existing tunnel;

exposing ground resulting from the removal of the primary shield segment assembly;

excavating the ground to form a cavity therein;

circumferentially driving a shield machine positioned in the cavity and mounted to bridge between two guide rings provided at both end portions of the perdetermined region and along the periphery of the existing tunnel;

mounting circumferential segments to bridge between the two rings and being fixedly piled one upon another on a rear surface of the shield machine so as to form a series thereof connected to the shield machine while the shield



machine is driven forward step by step in the circumferential direction of the existing tunnel along on the guide rings;

applying pressure to the rearmost one of the piled circumferential segments progressively formed; and

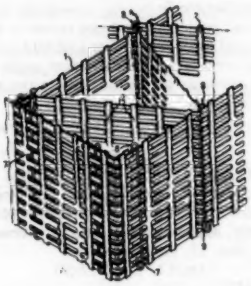
enlarging the periphery of the predetermined region lined with a ring of a series of circumferential segments.

4,530,622

RETAINING FILL IN A GEOTECHNICAL STRUCTURE

Frank B. Mercer, Blackburn, England, assignor to P.L.G. Research Limited, Blackburn, England

Filed Dec. 23, 1982, Ser. No. 452,816
Int. Cl.³ E02D *29/02*
U.S. Cl. 405—258 **16 Claims**



16. A retainer construction for retaining fill in a geotechnical structure, comprising at least one length of plastics material mesh which has vertically-spaced, generally horizontally-extending, orientated strands, substantial vertical walls of at least one compartment having been formed in the retainer construction by bending the mesh transversely, two portions of the mesh being connected together by loops, formed by transversely bending the strands of one portion, passing between the strands of the other portion so that the loops project out the opposite side of said other portion, and being retained by a rod means as a connecting member passing through the loops on said opposite side and preventing the loops being pulled back.

4,530,623

END CUTTER HEAD, FOR GEAR CUTTING MACHINES, CUTTERS FOR END CUTTER HEADS AND METHOD FOR REFACING SAID CUTTERS

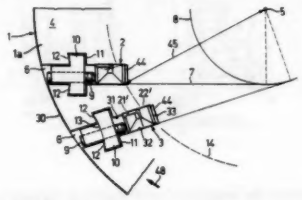
Erich Kotthaus, Wallisellen, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Dec. 20, 1982, Ser. No. 451,442

Claims priority, application Switzerland, Jan. 12, 1982, 145/82

Int. Cl.³ B26D *1/00*

U.S. Cl. 407—22 **5 Claims**



1. An end cutter head for gear cutting machines, said end cutter head comprising:

a body member containing at least one end face;

cutters supported by said body member and projecting from said end face of said body member;

each of said cutters having two cutting faces;

said cutting faces being displaced with respect to each other;

both of said cutting faces being bounded at one side thereof by a common separating face;

each of said cutters being divided to form two separate cutter halves by means of said separating face;

said cutters forming bar-type cutters;

said bar-type cutters being arranged in said end cutter head for adjustment in a longitudinal direction of said bar-type cutters;

said body member being provided with slots;

said cutters being placed in said slots;

each of said slots having a transversely extending groove;

a locking device provided in each transversely extending groove;

means on and coacting with said locking devices to retain each of said cutters in its associated slot;

supporting faces to support said locking devices formed in each of said transversely extending grooves;

said supporting faces extending at a predetermined angle towards said cutters; and

each said transversely extending groove having an arcuate supporting face at which its related locking device is supported by means of said arcuate supporting face.

4,530,624

DRILL PRESS WITH MEANS FOR TEMPORARILY INCREASING POWER TO THE MOTOR

Giuseppe Cuneo, Calolziocorte, Italy, assignor to Black & Decker Inc., Newark, Del.

Filed Jul. 1, 1983, Ser. No. 510,326

Claims priority, application Italy, Jul. 9, 1982, 22371/82[U]

Int. Cl.³ B23B *49/00*

U.S. Cl. 408—8 **11 Claims**

1. A drill press, comprising:

a base equipped with a column extending upwardly therefrom;

a head movably mounted on the column;

a chuck, for holding a drill bit, rotatably mounted in said head;

a control lever pivotally mounted on said head for moving said chuck parallel to said column;

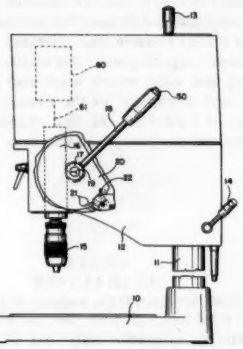
an electric motor mounted in said head for drivingly rotating said chuck;

start/stop means, mounted on said head, for starting and stopping said motor;

circuitry for controlling the speed of said motor;

said circuitry including a Triac in series with said motor, and a safety device which reduces the power to said motor when said motor stops rotating because of the drill bit becoming stuck in a workpiece;

a switch having an actuating member located at the end of



said control lever whereby the operator can conveniently and temporarily actuate said switch without letting go of said control lever; and

said switch being connected in parallel with said circuitry for temporarily shunting said Triac and overriding said safety device when the drill bit becomes stuck, whereby the power to the motor can be temporarily increased for freeing the stuck drill bit by temporarily actuating said switch.

4,530,625

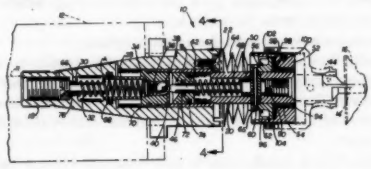
HYDRAULIC STOP

John E. Corley, St. Charles; Charles M. Andert, Florissant; Joseph H. Geen, St. Louis; Wesley G. Wells, Hazelwood, and Russell D. Lark, O'Fallon, all of Mo., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Mar. 26, 1984, Ser. No. 593,577

Int. Cl.³ B23B *49/00*

U.S. Cl. 408—14 **4 Claims**



1. A hydraulic stop for use with a rotating drill and drill bit to limit the depth of penetration of the bit into the workpiece comprising:

a body member attached at its first end to the spindle of the drill and designed to rotate about the axis of rotation of the drill, said body member having a cylindrical cavity at its second end;

a first sliding member to fit within said cavity of said body member, said sliding member engaging and rotating with said body member and capable of movement along the axis of rotation of said body member, said sliding member having a cylindrical cavity on end within said body member and drill engaging means on the opposite end;

a first chamber member to fit within the cavity in the body

member engaging said first sliding member and capable of sliding along the axis of rotation of said drill to form with said body member a first variable fluid chamber to hold hydraulic fluid providing stiffening of said stop during the cutting stroke;

a second chamber member to fit within the cavity located in said sliding member forming a second variable fluid chamber to receive and exchange fluid with said first fluid chamber through the valve means;

valve means located in said first chamber member to control the passage of fluid from said first variable fluid chamber to said second variable fluid chamber;

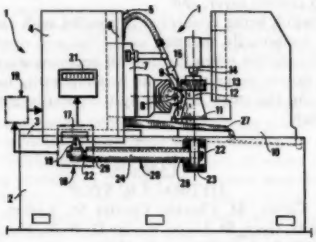
sensing means engaging said valve means, said sensing means opening said valve means when said drill bit has penetrated said workpiece to the desired depth permitting passage of fluid from the first chamber to the second chamber and the collapse of said stop.

4,530,626

GEAR CUTTER

Cesare Sabbioni, Bologna, Italy, assignor to CIMA S.p.A., Italy

Filed Mar. 22, 1983, Ser. No. 477,737
Claims priority, application Italy, Jun. 28, 1982, 3464 A/82
Int. Cl.³ B23F *23/10*
U.S. Cl. 409—10 **7 Claims**



1. Gear cutting comprising

a bedplate,

a first block mounted on said bedplate,

means for carrying a tool, the tool carrying means being mounted on the first block,

a second block mounted on said bedplate,

means for carrying in an axis of rotation a piece to be cut, the piece carrying means being mounted on the second block,

a device for detecting variations, due to the thermal expansion of the bedplate, in the distance said two blocks are apart,

drive means interlocked to said detection device and connected to at least one of said blocks in order to compensate continuously for said spacing variation,

said blocks being positioned on the bedplate along the longitudinal axis thereof,

one of said blocks being mounted in a way whereby it is able to slide, in the direction of said axis, on said bedplate,

the other block being integral with said bedplate,

said detection device comprising

a reference element and

reading means for reading said reference element,

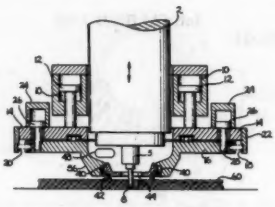
said reference element being integral with one, and said reading means with the other, of said sliding block and bedplate, whereby said reference element and reading means are movable with respect to each other as a result of thermal expansion of said bedplate.

4,530,627

PINLESS ROUTER

Wojciech B. Kosmowski, 647 Young St., Santa Ana, Calif. 92705

Continuation of Ser. No. 715,727, Aug. 19, 1976, abandoned.
This application Jun. 21, 1979, Ser. No. 50,755
Int. Cl.³ B23C *9/00*
U.S. Cl. 409—80 **18 Claims**



1. In a lateral movement router machine having a pressure foot, said router machine being of the type having a spindle carriage or like support member, at least one spindle mounted to the support member and vertically movable with respect thereto, and a means for causing relative lateral movement between said support member and a work piece, the pressure foot comprising:

(i) an upper member;

(ii) a holding member mounted to and beneath said upper member for relative lateral movement with respect to said upper member when decoupled therefrom;

(iii) decoupling means mounted on said upper member for selectively coupling said holding member to said upper member to prevent said relative lateral movement therebetween and decoupling said holding member from said upper member to enable said relative lateral movement therebetween; and

(iv) vertical movement means for vertically displacing said holding member and said upper member, said vertical movement means comprising at least one actuator coupled to said support member and said upper member; and

control means for directing said vertically movable spindle, said means for causing lateral movement, said decoupling means and said vertical movement means to (1) move said upper member and said holding member downward, relative to said work piece, from a first position to a second position when routing is begun on said work piece; (2) to cause said holding member and said upper member to remain in said second position until just before the routing is completed, (3) at which time (a) to cause said actuator to move said holding member and said upper member farther downward to a third position in which said holding member firmly presses against and thus secures said work piece, and (b) to cause said decoupling means to decouple said holding member from said upper member, thereby enabling said holding member to remain stationary and secure said work piece while said control means directs said means for causing lateral movement to move said spindle and said upper member laterally relative to said holding member and secured work piece until the routing is completed.

4,530,628

GUIDE SYSTEM FOR USE ON A SHIP

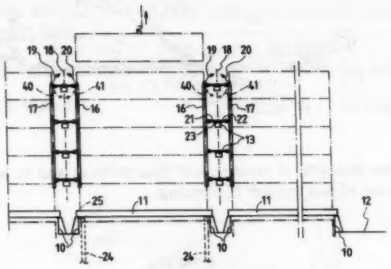
Jadwiga Igielska, Lerum, Sweden, assignor to Transconsultants AB, Gothenburg, Sweden

Filed Dec. 6, 1983, Ser. No. 558,521
Claims priority, application Sweden, Oct. 18, 1983, 8305726
Int. Cl.³ B61D *45/00*
U.S. Cl. 410—40 **6 Claims**

1. In a ship having an arrangement for handling groups of unitary objects such as containers on at least one deck, such as

a weather deck, equipped with pontoon hatch covers for closing openings in the deck, a guide system comprising:

a module device horizontally displaceable on the deck of the ship; and



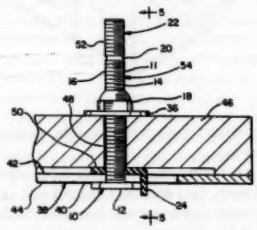
at least one pair of internal and one pair of external guides supported by said module device so that at least said one pair of internal guides is positionable from a first vertical position inside the margin of at least one opening in the deck closeable by a pontoon hatch cover to a second vertical position outside said margin.

4,530,629

TOILET BOWL MOUNTING BOLT ASSEMBLY

Lawrence Sakow, Rte. 29-Box 271, Zieglersville, Pa. 19492

Filed Sep. 27, 1982, Ser. No. 424,061
Int. Cl.³ F16B *39/24*
U.S. Cl. 411—147 **3 Claims**



1. A closet bolt assembly comprising

a bolt comprising a threaded shank and a head, the shank terminating at one end at the head and at the other end in a free terminus, the shank being of uniform diameter and being threaded throughout its length;

a resilient washer applied over the threaded shank,

the washer comprising a flat body including a hole therein, the hole being smaller in diameter than the outer thread diameter of the shank, the shank being inserted through the hole and the washer being frictionally engaged with the threaded shank:

the washer further comprising bendable means integral with the body to prevent rotation of the washer and the frictionally engaged shank;

a closet mounting floor flange having an arcuate opening defined between parallel sidewalls therein, a top surface and a bottom surface, the bolt head being positioned within the arcuate opening with the bolt head in contact with the flange bottom surface, with the threaded shank above the flange top surface and the resilient washer being in contact with the flange top surface, and

the bendable means of the washer being bent downwardly and being positioned within the flange arcuate opening and wherein the width of the washer body and the width of the bendable means is greater than the width of the arcuate opening,

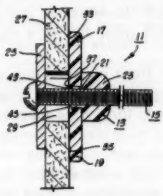
whereby the bendable means of the washer can be secured upon the floor flange by bending to support the bolt in an upright position.

4,530,630

EXPANDING ANCHOR FASTENER

Russell L. Brown, 6449 N. Grandmark Dr., Oklahoma City, Okla. 73116

Filed Jul. 14, 1982, Ser. No. 398,083
Int. Cl.³ F16B *13/04*
U.S. Cl. 411—340 **9 Claims**



1. An expanding anchor fastener for use in fastening to a wall having a circular hole of predetermined size comprising:

a right circular cylindrical body sized to closely fit through a circular hole of predetermined size, said body having an axial bore therethrough and first and second axial ends;

a wing support member having a longitudinal circular cylindrical segment shape sized to closely fit through a circular hole of predetermined size and having a bore therethrough connected with and coaxial to said axial bore of said cylindrical body, said wing support member having first and second opposed planar surfaces extending parallel to said wing support bore and joining perpendicularly with said first axial end of said cylindrical body to form first and second recessed shoulder spaces, respectively, therewith;

a first expanding wing element having a longitudinal circular cylindrical segment shape sized to closely fit through a circular hole of predetermined size and having a planar engagement surface foldably connected to said wing support member along said first planar surface of said wing support member such that said expanding wing element is movable from a collapsed, axial position to an open, radial position, said first expanding wing element having a shoulder disposed for being received in said first recessed shoulder space when said first expanding wing element is in an open, radial position such that said first expanding wing element is supported against axial movement beyond said open radial position by said first planar surface of said wing support element and by said first axial end of said cylindrical body;

a second expanding wing element having a longitudinal circular segment shape and sized to closely fit through a circular hole of predetermined size having a planar engagement surface foldably connected to said wing support member along said second planar surface of said wing support member such that said second expanding wing element is movable from a collapsed, axial position to an open, radial position, said second expanding wing element having a shoulder disposed for being received in said second recessed shoulder space when said second expanding wing element is in an open position such that said second expanding wing element is supported against axial movement beyond said open, radial position by said second planar surface of said wing support element and by said first axial end of said cylindrical body;

means for resiliently urging said first and second expanding

wing elements to a position between said open position and said collapsed position;

said wing elements when in said collapsed position conforming to a right circular cylindrical configuration of the same diameter as the right circular cylindrical configuration of said body and said wing support member;

bolt means connected to said cylindrical body for extending through said axial bore to connect said cylindrical body to an object such that said cylindrical body can anchor an object with said first and second wing elements in said open position.

6. An expanding fastener for use in fastening to a wall having a hole of predetermined size comprising:

a body portion with an axial bore therein for receiving a connecting bolt therethrough and including;

a cylindrical back piece having a right circular cylindrical shape;

a wing support front piece having a longitudinal circular cylindrical segment shape and joining with said cylindrical back piece to form wing support spaces therebetween;

a first expanding wing element having a front surface and a first axial end, said expanding wing element hingedly connected to said wing support front piece at said front surface, such that said expanding wing element is movable from a forward collapsed axial position to an open supported radial position, said expanding wing element having a shoulder extending rearwardly from said hinged portion of said front surface for engaging said wing support spaces such that said expanding wing element is supported both axially and radially when in an open expanded radial position;

a second expanding wing element having a front surface and a first axial end, said expanding wing element hingedly connected to said wing support front piece at said front surface, such that said expanding wing element is movable from a forward collapsed axial position to an open supported radial position, said expanding wing element having a shoulder extending rearwardly from said hinged portion of said front surface for engaging said wing support spaces such that said expanding wing element is supported both axially and radially when in an open expanded radial position;

said front surfaces of said wing elements forming an anchor surface conforming to a wall surface of the like when said wing elements are in an open expanded position;

said body portion, said wing support front piece and said wing elements, when in said collapsed positions, conforming to a right circular cylindrical configuration of the same diameter so as to closely fit through a hole of predetermined size; and

means for resiliently urging said first and second expanding wing elements to a position between said expanded radial position and said collapsed axial position.

4,530,631

PULL TAB FOR EASY OPEN CAN END-METHOD OF MANUFACTURE THEREOF

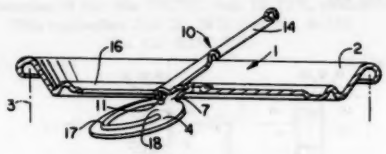
Elton G. Kaminski, Sidney, and Carl F. McEldowney, Russia, both of Ohio, assignors to The Stolle Corporation, Sidney, Ohio

Division of Ser. No. 513,447, Jul. 13, 1983, Pat. No. 4,465,209. This application Jun. 12, 1984, Ser. No. 619,914

Int. Cl.³ B21D *51/00*

U.S. Cl. 413—12 **7 Claims**

1. In the manufacture of a pull tab for an easy open can end, said pull tab having a rivet hole and a nose portion, the step of curling the peripheral edge of said nose portion into a continuous cylindrical cross-sectional shape so as to provide a high



beam strength, to rigidize said nose portion, and to prevent failure of said pull tab by bending.

4,530,632

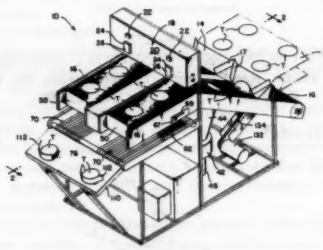
STACKING APPARATUS FOR FLEXIBLE, GENERALLY PLANAR FOOD PRODUCTS

Richard Sela, Yakima, Wash., assignor to ARR-Tech Manufacturing, Inc., Moxee, Wash.

Filed Jun. 14, 1983, Ser. No. 504,135

Int. Cl.³ B65G *57/04*

U.S. Cl. 414—35 **20 Claims**



1. An apparatus for stacking flexible, generally planar articles, comprising:

a flexible, air-permeable conveyor belt extending along the upper, lower, first end, and second end surfaces of a belt support, said conveyor belt being adapted to receive said articles at the upper surface of said belt support near the first end thereof;

a vacuum source;

a motor driving said conveyor belt so that it moves along the upper surface of said belt support from said first end to said second end;

a duct communicating between said vacuum source and a plurality of air inlets extending substantially continuously from the second end surface of said belt support along a portion of the lower portion of said belt support and terminating at a discharge station whereby said articles are carried by said conveyor belt along the upper, second end, and lower surfaces of said belt support to said discharge station, where said articles are dropped from said belt;

a discharge conveyor positioned beneath said belt support near said discharge station, said discharge conveyor being positioned a sufficient distance below said discharge station that said articles are flung downwardly and away from said second end onto said discharge conveyor to form a stack of said articles; and

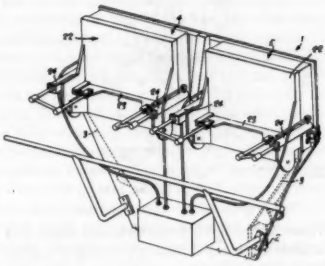
a drive mechanism causing said discharge conveyor to intermittently carry said stack of articles dropped onto said conveyor toward the second end of said belt support to a location where said stack of articles is removed from said discharge conveyor.

4,530,633

METHOD AND DEVICE FOR THE FEEDING OF ROD-LIKE ARTICLES TO THE HOPPER OF A HANDLING MACHINE

Oliviero Lodi, Pontecchio di Sasso Marconi, and Gianni Armaroli, Bologna, both of Italy, assignors to SASIB S.p.A., Bologna, Italy

Filed May 27, 1982, Ser. No. 382,806
Claims priority, application Italy, Jun. 2, 1981, 12538 A/81
Int. Cl.³ B65B *19/04*
U.S. Cl. 414—414 10 Claims



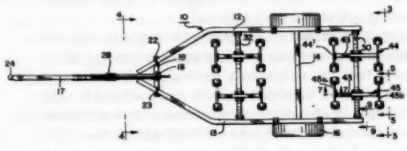
1. A device for feeding cigarettes to a cigarrete handling machine from a plurality of trays, each tray containing a plurality of the rod-like articles with the axes of the articles extending parallel to a first dimension of the tray and each tray having a second dimension transverse to its first dimension, said device comprising: a hopper disposed for receiving articles from the trays and for supplying the articles to the machine, said hopper having a flared inlet having two inlet portions; means for supporting two of the trays in line with each other in the direction of the second dimension of the trays above said flared inlet, with said inlet portions defining respective inlet openings which are dimensioned, in the direction of the second dimension of the trays, to receive the two trays when the two trays are supported above said inlet, said inlet opening thus having a separate inlet portion below each tray, and control means for permitting the descent of articles alternately from only one of the two trays until that tray is emptied while permitting a previously emptied tray to be replaced with a full tray, said control means including means operatively associated with each said inlet portion for preventing descent of cigarettes through the inlet portion in register with a tray being emptied as soon as that tray has been emptied, so that the level of cigarettes in the corresponding inlet portion is maintained just below the lowest layer of cigarettes in the stand-by full tray which replaces the previously emptied tray.

4,530,634

BOAT TRAILER WITH PIVOTAL DROPPED CROSS BAR ROLLER MOUNTING SYSTEM

Lawrence N. Johnson, W. 130 Highdrive, Spokane, Wash. 99203

Filed Aug. 9, 1979, Ser. No. 65,118
Int. Cl.³ B60P *3/10*
U.S. Cl. 414—534 16 Claims



1. A boat trailer comprising

at least two longitudinally extending side frame members carried on a wheel bearing axle,

said side frame members each having a forward converging portion forming a vehicle-engageable tongue for operative connection to a towing vehicle and a rear boat-supporting portion extending parallel to each other,

said parallel boat-supporting portion of said side frame members defining an open area therebetween throughout the length thereof without any fixed structural cross frame members interconnecting said parallel boat-supporting portions of said side frame members,

at least one cross support member extending transversely between said longitudinally extending side frame members to effect the parallel spacing thereof and pivotally connected to said boat-supporting portion of each of said longitudinally extending side frame members by bracket means for pivotal movement relative thereto,

boat hull engaging support members carried by said cross support member for pivotal movement therewith, and

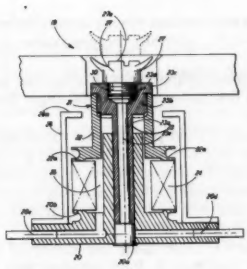
said cross support member having a downward curve along its length relative to said pivotal connections.

4,530,635

WAFER TRANSFERRING CHUCK ASSEMBLY

Orest Engelbrecht, Bethel, and Joseph L. Laganza, East Norwalk, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jun. 15, 1983, Ser. No. 504,718
Int. Cl.³ B65H *3/08*
U.S. Cl. 414—627 6 Claims



1. A chuck assembly, comprising:

housing means,

platen means disposed in said housing,

base means,

wafer lifter means centrally disposed in said housing for grasping and depositing a wafer onto said platen means without disturbing its spatial orientation,

said wafer lifter means comprising:

base means,

elevator means movable in the vertical direction relative to said base means,

metal bellows means connected to said base means and said elevator means normally biasing said elevator means in the down position and preventing rotational movement of said elevator means when it is moved in the vertical direction,

said base means, elevator means and metal bellows means forming an airtight volume,

first conduit means formed in said base means communicating with said airtight volume,

said platen means having a central opening located over said elevator means,

whereby application of pressurized air to said first conduit means causes said elevator means to be raised through said central opening and withdrawal of said pressurized air source causes said elevator means to be lowered with both

movements occurring without rotational movement of said elevator means.

4,530,636

DEVICE FOR OPERATING A HAND OF AN INDUSTRIAL ROBOT

Hajimu Inaba, Hino; Shinsuke Sakakibara, Kunitachi, and Ryo Nihei, Musashino, all of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

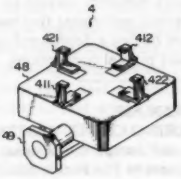
PCT No. PCT/JP81/00267, § 371 Date Jun. 4, 1982, § 102(e) Date Jun. 4, 1982, PCT Pub. No. WO82/01155, PCT Pub. Date Apr. 15, 1982

PCT Filed Oct. 7, 1981, Ser. No. 387,886

Claims priority, application Japan, Oct. 8, 1980, 55-139914

Int. Cl.³ B25J *15/00*

U.S. Cl. 414—730 **2 Claims**



1. A device for operating a hand of an industrial robot, comprising:

a first set of finger mechanisms having means for movement in a direction X;

a second set of finger mechanisms having means for movement in a direction Y, generally perpendicular to the direction X;

first and second hydraulic cylinders for driving said movement means of said first and second sets of finger mechanisms, respectively;

first and second hydraulic fluid passages for supplying hydraulic fluid to said first and second hydraulic cylinders through first and second solenoid valves, respectively;

parallel main and branch passages for alternately supplying hydraulic fluid to said first and second hydraulic fluid passages;

a third solenoid valve for controlling the supply of fluid between said main and branch fluid passages and said branch passage having a pressure reducing valve;

a fluid supply source for supplying the fluid with a constant pressure to said third solenoid valve;

means for supplying electrical signals to said first, second, and third solenoid valves; and

teaching means for independently controlling the movement of said first and second sets of finger mechanisms, such that the grasping force of said finger mechanisms is incrementally controlled by said teaching means.

4,530,637

WORKPIECE HANDLING APPARATUS

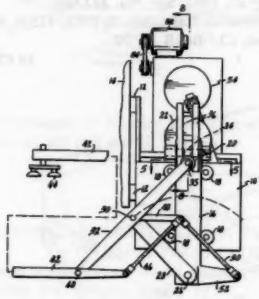
Arthur C. Mason, Warren; William M. Faltel, Pontiac, and James M. Haselhuhn, Troy, all of Mich., assignors to Lamb Technicon Corp., Warren, Mich.

Filed Jun. 28, 1983, Ser. No. 508,617

Int. Cl.³ B65H *5/08*; B23Q *7/04*

U.S. Cl. 414—750 **12 Claims**

1. A work handling device comprising a support, a vertically reciprocable slide on said support, a work transfer arm mounted on said slide for horizontal movement, a first rotatable member on said support which when rotated reciprocates the slide vertically through a predetermined stroke, a second rotatable member on said support which when rotated reciprocates the transfer arm horiozntally through a predetermined stroke, a motor, a pair of Geneva wheels having a driving connection, one with each of said rotatable members, means driven by said motor for rotating the Geneva wheels with a Geneva motion, and the driving connection between the motor-driven means and said Geneva wheels being constructed and arranged such that adjacent the opposite ends of the stroke of the transfer arm the Geneva wheel controlling reciprocation



of the slide is first rotated through a predetermined angle and then both Geneva wheels are rotated through a predetermined angle, then the rotation of the Geneva wheel controlling the reciprocation of the slide is arrested and the rotation of the other Geneva wheel is continued.

4,530,638

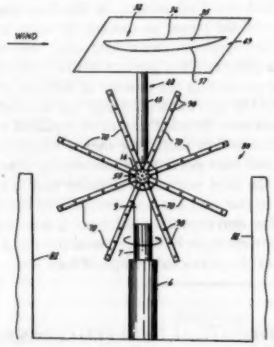
WIND DRIVEN POWER GENERATING APPARATUS

Walter Andruszkiw, 26626 Ryan, Warren, Mich. 48091, and Roman W. Andrushkiw, 41400 Malbeck, Sterling Heights, Mich. 48078

Filed Dec. 5, 1983, Ser. No. 558,002

Int. Cl.³ F03D *7/06*

U.S. Cl. 415—4 **6 Claims**



1. A vertically adjustable and horizontally rotatable wind driven power generating apparatus comprised of, in combination a well having a generally circular cross section in which is rotatably and vertically movably mounted a wind driven power generating apparatus comprised of:

(i) power generating means comprised of a horizontally extending shaft having two end portions and a central portion, a plurality of radially and axially extending shaped wind catching vanes fixedly mounted on both end portions of said shaft, two annular shaft support members in which said shaft is rotatably mounted disposed intermediate said vanes in the central portion of said shaft, and an axially extending bevel gear mounted on the central porton of said shaft intermediate said annular shaft support members;

(ii) means for vertical and rotational movement of said power generating means comprised of (a) a hollow vertical support column having a lower end and an upper end, said lower end having a circular cross section and said upper end being bifurcated to form two support arrms which are fixedly attached at their upper ends to and support said annular shaft support members, and (b) a vertically extending tubular member having a hollow interior therein fixedly mounted at one end in the well floor and open at its other end and adapted to rotatably and telescopically receive said lower end of said hollow vertical support column;

(iii) vertical movement control means comprised of (a) downward movement control means comprising an inverted wing system mounted on top of the annular shaft support members, and (b) upward movement control means comprising a cylinder having an axially movable piston therein, said piston defining an enclosed cavity within said cyclinder which contains a compressible gas and a second cavity containing a hydraulic fluid and in communication with the hollow interior of said vertically extending tubular member;

(iv) rotational movement control means comprising at least one vertically extending directional control surface mounted on at least one of said annular shaft support members; and

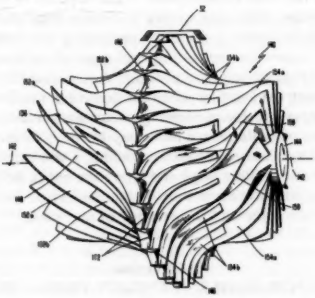
(v) power transmission means comprising a vertically extending drive shaft rotationally mounted in and longitudinally extending through said hollow vertical support column, said drive shaft being connected at its lower end to and driving a generator, and having fixedly mounted at its upper end a vertically extending bevel gear which is in meshed contact with said bevel gear on said horizontally extending shaft.

4,530,639

DUAL-ENTRY CENTRIFUGAL COMPRESSOR

Rolf J. Mowill, Oslo, Norway, assignor to A/S Kongsberg Vapenfabrikk, Norway

Filed Feb. 6, 1984, Ser. No. 577,359
Int. Cl.³ F01D *3/02*; F04D *29/38*
U.S. Cl. 415—98 **10 Claims**



1. An improved high performance centrifugal compressor of the type having a rotor with a pair of opposing axially directed low velocity inlets and a common, radially directed high velocity outlet, the compressor rotor having an integral, axisymmetric hub with a central, full radius portion and two tapering flanking portions, the hub defining, in part, twin flow paths through the compressor, the improvement comprising:

two sets of full length compressor blades mounted on the hub, the individual blades of each full length blade set extending along substantially the entire length of a respective one of the twin flow paths between the respective inlet and the outlet;

at least two sets of partial length compressor blades mounted on the hub, the individual blades of each partial length blade set extending along only the portion of a respective one of the twin flow paths proximate the high pressure radial outlet, the individual blades of the full length blade set and the partial length blade set in each flow path being positioned in alternating relation about the rotor circumference; and

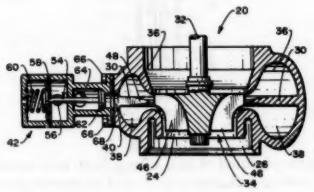
means for reducing variations in the velocity profile of the high velocity gas exiting the radial outlet, said means including a positioning about the rotor circumference of the individual blades of the full length blade set in one flow path to terminate at the high velocity radial outlet coincident with the individual blades of the partial length blade set in the other flow path.

4,530,640

METHOD AND APPARATUS FOR WASTEGATING TURBOCHARGED ENGINE WITH DIVIDED EXHAUST SYSTEM

Hugh MacInnes, La Canada, Calif., assignor to Roto-Master, Inc., N. Hollywood, Calif.

Filed Sep. 29, 1982, Ser. No. 426,815
Int. Cl.³ F02B *39/00*; F02D *23/00*
U.S. Cl. 415—144 **6 Claims**



1. In a radial in-flow turbine housing for turbochargers and the like, defining an inlet, an outlet located radially interiorally from said inlet, a centrally located turbine wheel cavity, and volute passageway means encircling said turbine wheel cavity and extending in and diminishing in cross-sectional area from said inlet to terminate at said cavity, the improvement comprising in combination an interior divider of scroll configuration having a first terminus at said inlet extending from said inlet to a second terminus at said cavity to bifurcate said passageway means into axially adjacent passages over an arc of between 180° and 300° and a single exit port communicating with said passageway means beyond the said second terminus of said divider, said second terminus being located radially between said outlet and said single exit port, said interior divider being uninterrupted intermediate said first terminus and said second terminus, for maintaining gas isolation in said passageway means prior to combining said gas after passing beyond said second terminus for communication with said single exit port.

4,530,641

PUMP, PARTICULARLY A SUBMERSIBLE OR BARREL PUMP

Alois Gschwender, Neubulach, Fed. Rep. of Germany, assignor to Flux-Geraete Gesellschaft Mit Beschraenkter Haftung, Stuttgart, Fed. Rep. of Germany

Filed Apr. 15, 1983, Ser. No. 485,540
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1982, 3214185
Int. Cl.³ F01D *25/00*
U.S. Cl. 415—170 R **16 Claims**

1. A pump comprising:

an elongated support housing;

an elongated drive shaft surrounded by said housing, said drive shaft having an upper end and a lower end, and being mounted in said support housing by at least one lower bearing and one upper bearing, an annular space being formed between said lower bearing and said drive shaft;

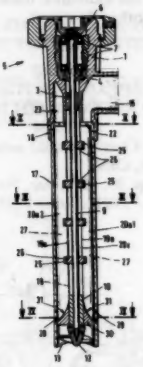
a rotor mounted to said lower end of said drive shaft;

a rotor chamber disposed around said rotor, said rotor cham-

ber having an upper portion bordering a lower part of said lower bearing;

at least one lifting duct having a lower end with an inlet in said rotor chamber, said lifting duct extending along said support housing in the direction of said shaft and having an upper end with an outlet;

a clearance gap formed in said support housing extending into said lifting duct, with walls separating said clearance gap



from a flow of liquid in said lifting duct, said annular space opening into said clearance gap, said clearance gap having a greater cross sectional area than said annular space and being substantially free of pressure during pump operation; and

an outlet passage connecting said clearance gap with space surrounding said pump to discharge liquid in said clearance gap, said outlet passage being disposed at a lower end of said housing above said rotor chamber.

4,530,642

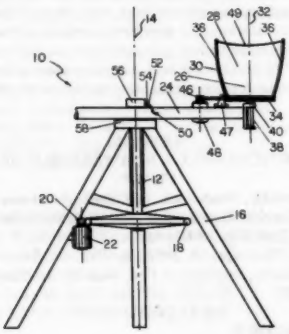
WINDMILL MECHANISM

Wei H. Yang, 3355 Geddes Rd., Ann Arbor, Mich. 48105

Filed Nov. 17, 1983, Ser. No. 552,945

Int. Cl.³ F03D *7/06*

U.S. Cl. 416—119 **2 Claims**



1. In a windmill comprising a power output shaft, means supporting said power output shaft for rotation about an axis, an arm projecting radially of said shaft, a wind responsive surface spaced radially of said axis and means operatively coupling said wind responsive surface with said output shaft such that in response to wind said wind responsive surface is caused to execute circular motion about said axis and deliver torque to said power output shaft, the improvement which comprises said wind responsive surface being a generally upright fabric sail having side edges, a mast structure supported on said arm and arranged in a supporting relation with said sail, said mast structure including a base and a pair of spaced apart resiliently flexible mast elements mounted on said base and supporting said side edges of said sail, said mast elements extending upwardly and diverging outwardly from said base, said mast elements being capable of flexing both leewardly and toward each other to provide automatic sail feathering in response to increased wind velocity acting upon said fabric sail.

4,530,643

CENTRIFUGAL PUMP IMPELLER

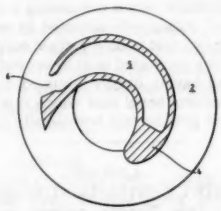
Valdemar Carlsson, Solna, Sweden, assignor to ITT Industries, Inc., New York, N.Y.

Filed Sep. 14, 1983, Ser. No. 532,126

Claims priority, application Sweden, Oct. 11, 1982, 8205775

Int. Cl.³ F04D *29/66, 29/38*

U.S. Cl. 416—144 **2 Claims**



1. A centrifugal pump impeller for pumping a fluid medium comprising:

an integral body including a vane being dimensioned such that the flow cross-section in the impeller is substantially constant, said vane having a leading edge and a trailing edge, an internal space for containing the fluid medium, and means for permitting exchange of the fluid medium between said internal space and the exterior of said vane to balance the impeller when the density of the fluid medium changes and for preventing accumulation in said internal space of pollutants which may become entrained in the fluid medium, said means including a slot extending adjacent said trailing edge and along the entire height of said vane constituting the sole communication between said internal space and the exterior of said vane.

4,530,644

DEVICE FOR DERIVING ENERGY FROM A FLOWING MEDIUM

Theodoor Van Holten, Pijnacker, Netherlands, assignor to Stichting Energieonderzoek Centrum Nederland, The Hague, Netherlands

Continuation of Ser. No. 449,451, Dec. 13, 1982, abandoned. This application Oct. 31, 1984, Ser. No. 666,136

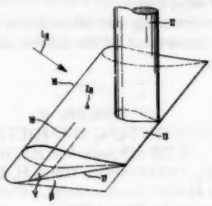
Claims priority, application Netherlands, Dec. 17, 1981, 8105689

Int. Cl.³ F03D *1/06*

U.S. Cl. 416—175 **10 Claims**

1. A device for deriving energy from a flowing medium, such as a wind motor comprising in the main a hub rotatable about its axis with nearly radially extending blades attached to it, each of the blades fitted at or near its tip with an auxiliary vane which, seen in a sectional plane defined by the relative direction of flow during operation and the centerline of the blade, is positioned so that the chord of the auxiliary vane profile extended forward and lying in said plane intersects a line which lies in said plane, runs nearly parallel to the relative

direction of flow and passes through the axis of rotation of the hub, characterized in that the auxiliary vane (13) is placed with



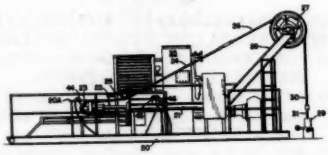
respect to the blade so that the low-pressure peaks of vane (13) and blade (12) are separated one from the other during rotation by more than 0.3-times the length of the largest chord.

4,530,645

OIL WELL PUMPING APPARATUS

David L. Whatley, and Wallace M. Chaviers, both of Wichita Falls, Tex., assignors to Hydraunit Venture, Wichita Falls, Tex.

Filed Sep. 21, 1979, Ser. No. 77,537
Int. Cl.³ F04B *47/04*
U.S. Cl. 417—399 **7 Claims**



1. For use with a polish rod and connected string of sucker rods, a surface oil well pumping apparatus with a hydraulic control circuit comprising:

(a) a main hydraulic cylinder and single acting main ram connected to raise and lower the polish rod, limit switch means variably positionable for actuation along the travel stroke of said main ram element having actuating elements positioned to be triggered at predetermined positioning of said main ram element, one of said limit switch means being positioned to be actuated to control stopping the main ram travel in an upward direction of said rod when the polish rod is at its uppermost position, another of said limit switch means being positioned to be actuated along the stroke of said main ram travel for deceleration control of the downward travel of said polish rod as the polish rod approaches the lower limit of its travel and a third limit switch means being positioned to be actuated by said main ram element when the polish rod is at its lowermost position for stopping the polish rod before commencement of an upward pumping stroke of said polish rod,

(b) hydraulic means in said control circuit to cause said main ram to raise the polish rod in one direction and to lower the polish rod in the other direction,

(c) variable control means for positioning said limit switches at various places along the travel of the main ram to control the hydraulic circuit,

(d) hydraulic control means to cause said main ram to gradually retard the lowering rate of the sucker rod string in response to the limit switch means for deceleration control,

(e) and pause means responsive to said first and third limit switch means for control of said hydraulic circuit to cause said main ram to maintain the sucker rod string in the maximum raised position for a predetermined time period to permit oil to flow into the sucker rod string to be pumped to the surface.

4,530,646

PUMP JACK OPERATED COMPRESSOR

Charles D. McCoy, 5101 N. Ave. "A", Apt. 270, Midland, Tex. 79701

Filed Apr. 12, 1983, Ser. No. 484,235
Int. Cl.³ F04B *19/00, 29/00*
U.S. Cl. 417—464 **9 Claims**

1. A compressor adapted to be associated with a pump jack on a producing well with the pump jack including a driven walking beam operating a downhole pump, said compressor comprising an elongated cylinder, a piston reciprocal in said cylinder, a piston rod connected to said piston and extending axially from one end of said cylinder, said cylinder including valved inlet means and valved outlet means for compressible fluid to enable compression thereof, means connecting the upper end of the cylinder to the beam, and means connecting the piston rod to a support structure below the beam whereby oscillation of the beam will compress fluid in the cylinder, said pump jack walking beam having a lower flange, said means connecting the cylinder to the beam including a flange clamp with pointed elements engaged with the flange for securely retaining the clamp in adjusted position on the flange, and a pivotal connection between the clamp and the upper end of the cylinder for relative movement between the beam and cylinder about an axis generally parallel to the axis of pivotal movement of the beam.

4,530,647

PERISTALTIC PUMP HAVING CONICAL ROLLERS

Fumio Uno, Matsuyama, Japan, assignor to Unolab Co., Ltd., Saitama, Japan

Filed Feb. 8, 1984, Ser. No. 578,370
Claims priority, application Japan, Apr. 1, 1983, 58-48424
Int. Cl.³ F04B *43/12*
U.S. Cl. 417—477 **10 Claims**

1. A fluid pump comprising:

a pump body having an adjustable retaining means;

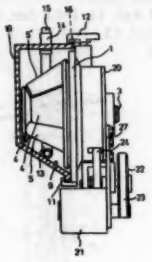
a rotor shaft rotatably supported in the pump body and having an axis of rotation;

at least one roller shaft mounted about said rotor shaft axis of rotation, said roller shaft having axis of rotation which intersects said rotor shaft axis of rotation and which is directed away from said pump body;

a tapered roller rotatably mounted on said roller shaft and comprising a generally truncated frustoconical surface, said tapered roller defining a frustoconical rotational envelope centered on said rotor shaft axis of rotation, an

apex of said frustoconical envelope being directed away from said pump body;

a removable head case supported on said pump body by said adjustable retaining means for at least partially enclosing said tapered roller, said head case having a generally frustonconical inner surface generally complementary



with and opposing at least a portion of said frustoconical rotational envelope to form an adjustable gap therebetween;

at least one fluid pump tube disposed in said adjustable gap to be compressed between said tapered roller and said generally frustoconical inner surface.

4,530,648

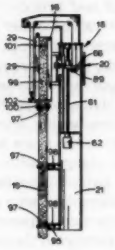
WALL CLIMBING FORM HOIST

Jim D. Phillips, Des Moines, Iowa, assignor to Economy Forms Corporation, Des Moines, Iowa

Filed Apr. 18, 1984, Ser. No. 601,717

Int. Cl.³ E04G *11/28*

U.S. Cl. 425—65 **7 Claims**



1. A wall climbing form hoist for handling inner and outer form units in the successive pouring of horizontal panels of a concrete wall structure comprising:

(a) a frame means having an outer form unit mounted thereon,

(b) a tubular mast movably supported on said frame means for relative up and down movement, said mast having an upper section and a lower section,

(c) reversible power transmission means within the upper section of the mast including a rotatable drive means and a linearly movable driven unit,

(d) means releasably connecting the driven unit to said frame means,

(e) said power transmission means, when the driven unit is releasably connected to the frame means and the outer form unit and inner form unit are mounted on and connected to the wall structure, being rotated in one direction to move the mast section upwardly relative to said frame means, and, when the lower mast section is secured to the wall structure and the driven unit is released from the frame means, being rotated in reversed directions to linearly move the driven unit up and down within the upper mast section,

(f) a jib on the upper mast section having a lift means for the inner form unit, and

(g) means for operating said lift means in response to the up and down movement of the driven unit relative to said frame means.

4,530,649

APPARATUS FOR FEEDING OF MOLTEN STRANDS TO A DRAINAGE TROUGH

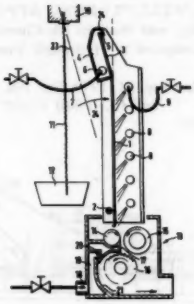
Heinrich Philipp, Aschaffenburg; Horst H. Lettner, Glattbach, and Friedrich Hunke, Grossostheim, all of Fed. Rep. of Germany, assignors to AUTOMATIK Apparate-Machinenbau H. Hench GmbH, Grossostheim, Fed. Rep. of Germany

Filed Nov. 16, 1982, Ser. No. 442,148

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1981, 3145613

Int. Cl.³ B29F *3/08, 3/01*

U.S. Cl. 425—71 **16 Claims**



1. Extrusion apparatus having a drainage trough for controlling the feed of at least one molten strand of material emerging from at least one nozzle, said trough being movable between an operating position for collecting the strand on the trough in a line of fall from said nozzle and a non-operating position for bypassing the trough by the strand said trough having a horizontal pivot means displaced from an upper end of the trough and being pivotable about said pivot means from the operating position where the strand can be collected on the trough, such that said upper end passes through the line of fall of the strand, to a non-operating position where the strand can fall freely behind the trough without contacting the trough, and a collection part of said trough being coupled with an element which separates a plurality of strands during movement of said collection part and means for supplying cooling fluid to cool said strands.

4,530,650

APPARATUS FOR SIZING EXTRUDED PLASTICS SECTIONS

Francesco Milani, Lonate Pozzolo, Italy, assignor to Milani Resine S.p.A., Italy

Filed Jul. 9, 1984, Ser. No. 629,082

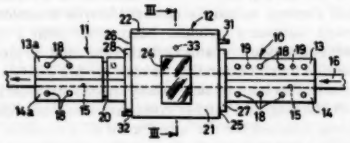
Claims priority, application Italy, Jul. 26, 1983, 22229 A/83

Int. Cl.³ B29C *17/00*

U.S. Cl. 425—71 **9 Claims**

1. An apparatus for sizing an extruded plastic section comprising inlet and outlet sizing gauge portions each in the form of a metal block having a cavity therethrough, means for placing each cavity under vacuum whereby an extruded plastic section passing through each cavity is sized to the configuration thereof, a tank positioned between said inlet and outlet sizing gauge portions which is freely transversed by the ex-

truded plastic section as it passes from the inlet sizing gauge portion to the outlet sizing gauge portion, said tank having two opposite inlet and outlet side walls having respective inlet and outlet openings therein, means for securing said inlet and outlet sizing gauge portions to said respective inlet and outlet side walls, said inlet and outlet openings having a greater transverse



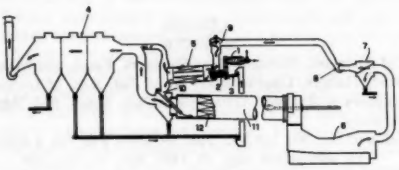
area than the transverse area of said inlet and outlet cavities, respectively, whereby an extruded plastic section passes unobstructedly through said inlet and outlet openings, means in said tank for subjecting the extruded plastic section to a cooling fluid, and said cooling fluid subjecting means includes spray nozzles disposed at corners of said tank inlet side wall directed toward the extruded plastic section.

4,530,651

INSTALLATION FOR TREATING IN LONG KILNS WITH A HALF-DRY PROCESS WET SLURRIES OF RAW MATERIALS FOR THEIR CONVERSION INTO PORTLAND CEMENT CLINKER

Renato Bucchi, Bergamo, Italy, assignor to ITALCEMENTI Fabgriche Riunite Cemento S.p.A., Milan, Italy

Filed Feb. 8, 1979, Ser. No. 10,606
Claims priority, application Italy, Feb. 10, 1978, 20187 A/78
Int. Cl.³ B29C *1/00*
U.S. Cl. 425—94 **3 Claims**



1. An installation for processing in existing wet process kilns converted to half dry process kilns wet slurries of raw materials for cement to be converted into clinkers, said installation comprising means for supplying watery slurries of raw material having a water content of from 28% to 45%, an apparatus for receiving and partially demoisturizing watery slurries, said apparatus including a horizontal centrifugal separator, an extruder connected to said separator for receiving partially demoisturized material from said separator and forming therefrom paste slugs, a dry powder proportioning device for supplying dry powder to paste slugs exiting said extruder to stiffen and demoisturize the paste slugs, and an evaporator for receiving dry powder coated paste slugs exiting from said extruder and further demoisturizing the paste slugs for delivery to converted existing wet process kilns, said installation including a converted existing wet process kiln having internal heat exchangers for receiving powdered and demoisturized paste slugs from said evaporator, said evaporator including a rotary cylinder through which, in equicurrent relationship with said paste slugs and the powdered material, hot gases flow.

4,530,652

ASPHALT COMPOSITION

Ollie G. Buck, and Floyd E. Naylor, both of Suite 1107, 1825 K St., NW., Washington, D.C. 20006

Filed Jan. 12, 1984, Ser. No. 570,107
Int. Cl.³ B32B *11/10*; C08L *53/02, 95/00*
U.S. Cl. 428—291 **19 Claims**

1. An asphalt composition with improved physical properties comprising an asphalt and conjugated diene/monovinyl aromatic block copolymer which is dispersable in asphalt, wherein the copolymer has a vinyl content of at least about 25 percent based on total diene content, and said aromatic block copolymer is present in a minor amount effective to improve at least one of dispersability in asphalt, viscosity, high temperature flow resistance and low temperature break resistance.

6. An asphalt composition comprising an asphalt and about 10–20 weight percent of butadiene/styrene radial teleblock copolymer with the butadiene to styrene monomer ratio from about 50/50 to about 85/15, a percent vinyl unsaturation of about 25–50 percent, based on total diene content, and a number of average molecular weight between about 150,000 to about 250,000.

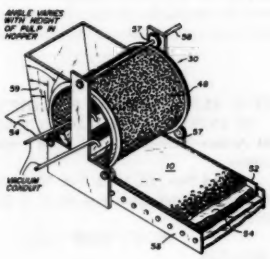
8. An article of manufacture comprising an asphalt composition according to claim 6 coated on a non-woven fabric.

4,530,653

APPARATUS FOR FORMING EMBOSSED ACOUSTICAL TILE

Yasuo Ishii, Chicago, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Division of Ser. No. 257,066, Apr. 24, 1981, Pat. No. 4,464,656.
This application Jun. 27, 1984, Ser. No. 625,083
Int. Cl.³ B29D *7/14*
U.S. Cl. 425—363 **3 Claims**



1. An embossing roller apparatus, for producing a high fidelity, sharply delineated three-dimensional pattern in the surface of fiber acoustical tile comprising

a hollow cylinder, said cylinder containing a plurality of perforations penetrating therethrough,

a screen overlaying said cylinder;

and a three-dimensional, discontinuous pattern matrix of plastic overlaying said screen and said screen being imbedded in said matrix whereby interstices in said matrix communicate with perforations in said cylinder to allow passage of air without substantial passage of fiber.

4,530,654

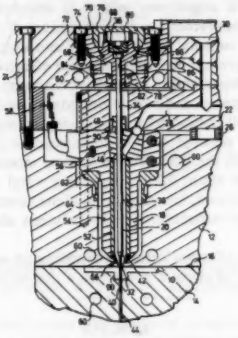
INJECTION MOLDING PERIPHERAL OPENING CORE RING GATE

Thomas J. Rose, Stow, Ohio, assignor to Mold-Masters Limited, Georgetown, Canada

Filed May 29, 1984, Ser. No. 614,854
Int. Cl.³ B29F *1/03*
U.S. Cl. 425—566 **5 Claims**

1. In an injection molding system for filling a cavity which is defined between a cavity plate and a movable mold platen to

form a molded product with a hole therethrough, having a gate extending through the cavity plate to the cavity, a bore in the movable mold platen which is in alignment with the gate, an elongated valve pin and valve pin actuating mechansim which reciprocates the valve pin between a retracted open position and a forward closed position, and a melt passage which extends through a manifold and around the valve pin to convey pressurized melt from a molding machine to the gate,



the improvement wherein the valve pin has a stem portion and a smaller diameter tip portion which extends in central alignment from a tapered shoulder at the stem portion through the gate and into the bore in the movable mold platen, the tip portion being nearly equal in diameter to the bore in the movable mold platen but substantially smaller in diameter than the gate, whereby in the retracted open position melt flows into the cavity through the gate around the tip portion of the valve pin, and in the forward closed position the tapered shoulder is seated in the gate.

4,530,655

MOUNTING ARRANGEMENT FOR DIE CLOSING UNIT OF INJECTION MOLDING MACHINE

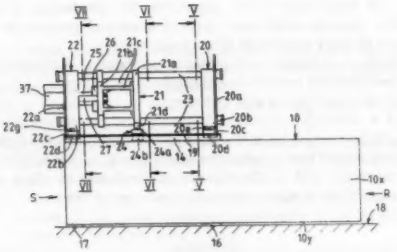
Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany

Filed Nov. 22, 1982, Ser. No. 443,644

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1981, 3145973

Int. Cl.³ B29F *1/00*

U.S. Cl. 425—589 **15 Claims**



1. A mounting arrangement for a die closing unit on the machine base of an injection molding machine, wherein

the machine base is an elongated rigid structure with an upper side to which are attached two laterally spaced parallel longitudinal guide rails, the guide rails having horizontal guide faces defining a common horizontal mounting and guiding plane and oppositely inwardly facing parallel vertical guide faces defining centering and guiding flanks;

the guide rails are located on opposite sides of a vertical longitudinal center plane which is the center plane for the machine base and for the die closing unit;

the die closing unit comprises a rigid stationary assembly constituted by a transversely oriented stationary die carrier plate adapted for the attachment of a stationary die half thereto, an axially spaced likewise transversely oriented stationary cylinder head plate with a hydraulic actuator assembly attached thereto, and a plurality of parallel axially extending tie rods having their extremities attached to both of said axially spaced stationary plates;

the die closing unit further comprises a movable die carrier frame adapted for the attachment of a movable die half thereto and connected to said hydraulic actuator assembly to be driven by the latter in axial die closing and die opening movements, the tie rods reaching through guide bores of the movable die carrier frame;

the stationary die carrier plate and the stationary cylinder head plate each have two outwardly extending horizontal heel portions engaging the horizontal guide faces of the guide rails and two downwardly extending vertical heel portions engaging the vertical guide faces of the guide rails, so as to create a predetermined alignment relationship between said rigid stationary assembly and the two guide rails, one of said two stationary plates having its horizontal heel portions clamped to the horizontal guide faces of the guide rails, and the other plate being free to execute small axial displacements in guided engagement with the guide rails, in response to tensile-stress-induced elongation of the tie rods; and

said stationary plate which is free to execute axial displacements has its horizontal heel portions engaged against the horizontal guide faces of the two guide rails by virtue of the weight of said plate and components carried by it, said plate including, in each horizontal heel portion, a vertical bore, a spacer sleeve positioned in said bore so as to form an annular displacement gap therewith, and a bolt reaching vertically through the spacer sleeve to clamp it to the horizontal guide face of the guide rail.

4,530,656

BURNER

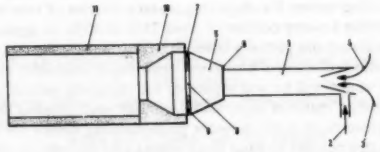
Detlef Altemark, Dorsten; Hans Sommers, Essen, and Manfred Weid, Haltern/Lippramsdorf, all of Fed. Rep. of Germany, assignors to Ruhrgas Aktiengesellschaft, Essen, Fed. Rep. of Germany

Division of Ser. No. 160,892, Jun. 19, 1980, Pat. No. 4,439,135. This application Aug. 10, 1983, Ser. No. 521,799

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1979, 2926278

Int. Cl.³ F23C *5/00*

U.S. Cl. 431—8 **13 Claims**



1. A burner for carrying out a process for the operation of a pre-mixing burner under at least normal pressure with gaseous fuels, or with fuels which are liquid at normal temperature and completely vaporized before combustion, at low combustion temperatures, forming waste gases having a low content of noxious substances,

the process comprising the steps of feeding to the burner a homogeneous non-stoichiometric mixture comprising a

fuel in gaseous and respectively vaporized state, a combustion air quantity which is required for the complete combustion of the fuel and a cooling gas quantity for setting the combustion temperature of 1100° C. to 1700° C., combusting the mixture in the burner in at least one central main flame which is surrounded by several support flame rings, and protecting the arising total flame against access of ambient air and/or waste gas and against cooling or heating until burning is completed,

the burner comprising,

a mixer pipe with supply conduit means for supplying the fuel, the combustion air and the cooling gas, respectively, said supply conduit means for supplying a relatively large amount of the combustion air and the cooling gas as compared with the amount of combustion gas in the mixture so as to provide the combustion temperature of 1100° C. to 1700° C., said mixer pipe constituting means for homogeneously mixing the fuel, the combustion air and the cooling gas so as to provide said homogeneous non-stoichiometric mixture,

a burner head adjoining said mixer pipe at a connection portion thereto, the cross-section of said burner heat at the connection portion to the mixer pipe being 1.1 to 3.8 times the cross-section of said mixer pipe and the cross-section of said burner head widening downstream to a widened end thereof to 2.0 to 6.8 times the cross-section of the mixer pipe,

a burner plate disposed at said widened end of the burner head and having at least one unobstructed main flame bore which extends parallel to the burner axis and having a plurality of small support flame openings which extend in several concentric rings around the main flame bore forming a freely burning flame, at least said support flame openings in the outermost concentric ring extend at an angle of 10° to 70° relative to the burner axis, said at least one unobstructed main flame bore being substantially enlarged compared to said small support flame openings, and said main flame bore and said burner head effecting a reduction in the velocity of the mixture upstream of the burner plate,

a burner mouth adjoining said burner plate and receiving the freely burning flame, said burner mouth has the same cross-section as that of said burner plate and thereat is formed cylindrically over an axial length and narrows therefrom downstream thereof to a narrow end of 1.4 to 4.9 times the cross-section of said mixer pipe, and

a flame guard means for surrounding the flame, said flame guard means having an inner diameter which corresponds to a maximum external diameter of the freely burning flame, whereby flame temperature is so homogeneous that the low content of noxious substances formed corresponds essentially to that of a theoretical combustion temperature.

4,530,657

BURNER APPARATUS

David F. Brashears, and Travis G. Porter, both of 2140 W. Washington St., Orlando, Fla. 32805

Filed Jan. 31, 1984, Ser. No. 575,433

Int. Cl.³ F23M 9/00

U.S. Cl. 431—188 **12 Claims**

1. A burner apparatus adapted to be attached to a rotary dryer comprising in combination:

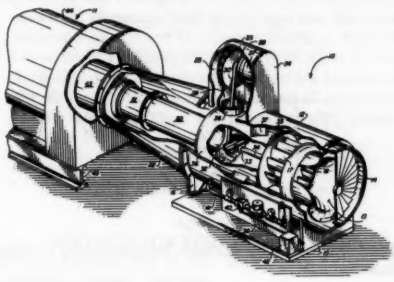
a burner housing having an air intake thereinto;

a burner head mounted in said burner housing;

a primary air conduit connected to said burner head for directing air therethrough;

a low pressure blower mounted to draw air into said housing through said air intake and to direct air around said burner head into a rotary dryer, or the like; and

a high pressure blower mounted in an auxiliary housing portion and having an input and an output, the input being operatively coupled to the housing to draw off a portion of the air being drawn into the housing air intake by the low pressure blower and directing the air out the output and through the primary air conduit and to the burner



head whereby high pressure air and low pressure air are simultaneously fed to the combustion area of the burner.

4,530,658

VAPORIZATION BURNER

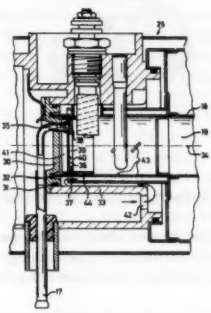
Karl Panick, Planegg, Fed. Rep. of Germany, assignor to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

Filed Jul. 22, 1983, Ser. No. 516,381

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1982, 3233321

Int. Cl.³ F23D 13/14

U.S. Cl. 431—329 **20 Claims**



1. A vaporization burner for a heater operated by means of liquid fuel, especially a motor vehicle heater, comprising a combustion chamber, an absorbent body situated for receiving fuel via a fuel connection and disposed on a carrier mounted in said combustion chamber, and air chamber means, disposed between the carrier and an end wall of the combustion chamber, for acting as a heat shield relative to surrounding parts that protects against the dissipation of heat from said carrier.

4,530,659

TEMPERATURE MEASUREMENT TECHNIQUE

Kenton B. Wright, Newburgh, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.

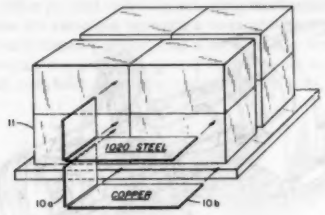
Filed Dec. 29, 1983, Ser. No. 566,521

Int. Cl.³ F27D 21/00; F27B 7/00

U.S. Cl. 432—32 **16 Claims**

1. A method of determining the penetration of an isotherm into a mass, comprising distributing material in the mass, said material having the ability to fix a record of an isotherm, cy-

cling the temperature of the mass, and checking said material for the location of said isotherm relative to the mass, the material comprising sheet, the isotherm being indicated by a line on the sheet.

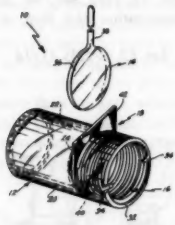


4,530,660

ANALYTICAL FURNACE WINDOW ASSEMBLY

Larry S. O'Brien, St. Joseph, and William R. Strunk, Stevensville, both of Mich., assignors to Leco Corporation, St. Joseph, Mich.

Filed Feb. 29, 1984, Ser. No. 584,637
Int. Cl.³ F27D *21/00*; B65D *43/20*
U.S. Cl. 432—32 **13 Claims**



1. An analytical furnace window assembly comprising:
an inner tube including a furnace end and an opposite window end;
an outer tube positioned about said inner tube, said outer tube defining slot means for permitting transverse access to said window end of said inner tube through said outer tube;
a window installable through said transverse slot to a position overlying said window end; and
bias means for biasing said window against said window end when said window is installed within said slot.

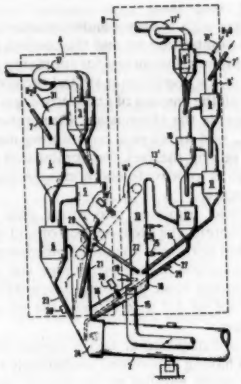
4,530,661

APPARATUS FOR THE CALCINATION OF FINE GRAINED MATERIAL

Horst Herchenbach, Hennef, and Andris Abelitis, Rösrath, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Sep. 14, 1984, Ser. No. 650,658
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1983, 3333718
Int. Cl.³ F27B *7/02*
U.S. Cl. 432—106 **7 Claims**

1. An apparatus for the calcination of fine grained material, particularly cement clinker, comprising:
two essentially parallel preheater lines for preheating portions of the meal to be calcined,
a clinker-forming zone having an exhaust means for hot gases,
means for directing hot gases from said clinker-forming zone into the first of said preheater lines,
a calcination zone receiving preheated meal from the second of said preheater lines,
means for delivering hot combustion air from a cooler into said calcination zone,
divider means in said first preheater line delivering a portion



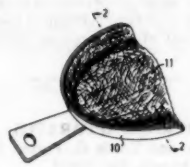
of the preheated meal to said exhaust means of said clinker-forming zone and another portion/to said calcination zone,
said calcination zone being in the form of a vertical, reaction duct having a downwardly curved upper portion, and
conduit means connecting said vertical reaction duct with said exhaust means for hot gases in said clinker-forming zone.

4,530,662

IMPRESSION TRAY FOR DENTAL PURPOSES

Bror A. E. Andersson, Österängsvägen 24, S-182 46 Enebyberg, and Ragnvald E. Lindblom, Alsäter, S-740 10 Almunge, both of Sweden

Filed Apr. 26, 1983, Ser. No. 488,643
Int. Cl.³ A61C *9/00*
U.S. Cl. 433—37 **7 Claims**



1. An impression tray for dental purposes, including a shovel-like blade which at certain portions of its inside is provided with means forming attachments for impression material which is put on the tray in a semi-liquid or plastic condition for taking an impression of a lower or upper jaw, the impression material being allowed to solidify before removing the tray, characterized by attachment means forming a layer of uniformly distributed thread-shaped attachment means, the thread-shaped attachment means having a stiffness such that they can penetrate into the semi-liquid or plastic impression material when the tray with the impression material is pressed against the respective jaw, such that the closely-lying attachment means will be incorporated as effective anchoring means in the bottom layer of the impression material when the impression material has

solidified and the tray is to be removed, the attachment means forming a mat or felt of filaments in all directions to form a porous anchoring mat of filaments, said filaments being permanently secured to the tray wherever the filaments touch the tray, thereby to ensure removal of the tray and the filaments and the impression material as a unit.

4,530,663

DENTURE MAGNETIC RETENTION UNIT

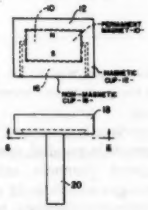
Leonard L. Portnoy, 8820 Wilshire Blvd., Suite 303, Beverly Hills, Calif. 90211

Filed Jul. 13, 1984, Ser. No. 630,675

The portion of the term of this patent subsequent to Feb. 14, 2001, has been disclaimed.

Int. Cl.³ A61C *13/22*

U.S. Cl. 433—189 **7 Claims**



1. A denture magnetic retention unit comprising: a first component in the form of a first cup-shaped member of magnetic material having an open top, a permanent magnet positioned within said first cup-shaped member, and a second cupshaped member of non-magnetic material extending into said first cup-shaped member to retain the magnet in said first cup-shaped member; and a second component in the form of a keeper of magnetic material positioned to extend across the open top of said cup-shaped member to close the magnetic field with said open top when the denture is in place.

4,530,664

COBALT-CHROMIUM ALLOYS

Arun Prasad, Cheshire, and Grant P. Day, Meriden, both of Conn., assignors to Jeneric Industries, Inc., Wallingford, Conn.

Continuation of Ser. No. 192,335, Sep. 29, 1980, abandoned, which is a continuation-in-part of Ser. No. 93,184, Nov. 13, 1979, abandoned. This application Mar. 24, 1983, Ser. No. 478,832

Int. Cl.³ C22C *19/07*

U.S. Cl. 433—207 **5 Claims**

1. A porcelain-fused-to-metal dental restoration comprising porcelain fused to a casting of a cobalt-chromium alloy consisting essentially of:

Element	Weight Percent
Cobalt	50–70
Chromium	25–35
Molybdenum	2–10
Manganese	0–2
Carbon	0–0.1

and

(i) from about 3.5 to about 6% silicon, or

(ii) from about 2 to about 6% silicon and from about 0.1 to 1.5% boron with the proviso that the combined amount of silicon and boron is greater than or equal to 3%, or

(iii) from about 1 to about 6% aluminum, or

(iv) from about 1 to about 6% silicon and from about 1 to about 6% aluminum with the proviso that the combined amount of silicon and aluminum is less than about 8%, or

(v) from about 1 to about 6% silicon, from about 0.1 to about 1.5% boron and from about 1 to about 6% aluminum with the proviso that the combined amount of silicon and aluminum is less than about 8%, the named alloy constituents totalling 100%.

4,530,665

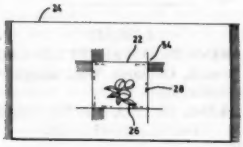
METHOD FOR STITCHING PATTERN

Shirley R. Colonel, Box 11, Site 21, R.R. #1, Creston, British Columbia, Canada V0B 1G0

Filed Feb. 22, 1983, Ser. No. 468,387

Int. Cl.³ G09B *19/20*; D05C *17/00*

U.S. Cl. 434—95 **16 Claims**



1. A method of stitching a pattern on fabric comprising providing a piece of interwoven netting having rows of square holes and the desired pattern printed thereon and fabric on which said pattern is to be stitched, attaching said netting to said fabric so that the pattern on the netting directly overlies the area on said fabric where the pattern is to be reproduced, stitching the pattern onto the fabric using a needle and threads and a cross-stitch, the thread on each stitch being pushed up from the inside surface of said fabric and through the center of a hole in one row of said netting, then being crossed over an intersection of said netting on an angle to the threads forming said netting, and then being drawn down through a hole in a row adjacent said one row and through said fabric, and upon completion of the stitched pattern removing the netting by drawing out the threads thereof one thread at a time.

4,530,666

WALK-IN GLOBE

James T. Triplett, P.O. Box 4, Chester, S.C. 29706

Filed Jul. 20, 1984, Ser. No. 632,907

Int. Cl.³ G09B *27/08*

U.S. Cl. 434—141 **7 Claims**

1. A walk-in globe for educational purposes comprising:

a hollow sphere large enough to hold a person;

means for stationarily supporting the sphere;

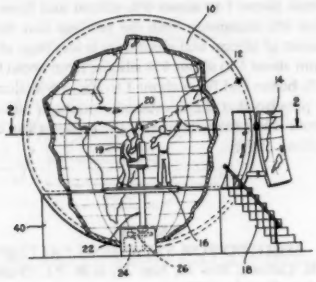
an accurately scaled map of the entire earth substantially covering the entire inner surface of the sphere;

a door mounted on the sphere for allowing entry of a person into the interior of the sphere, so that upon entry of the person into the sphere, the person may view the accurately scaled map of the entire earth

a portion of said map being on an inside of said door;

an elevated support platform centrally located in said sphere for supporting a person while viewing said map carried on the inner surface of said sphere, said support platform being constructed of transparent material for allowing a person

standing on said platform to have a substantially unobstructed view of the earth;



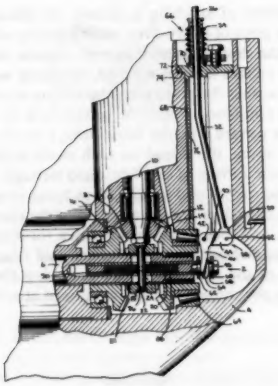
whereby a person can unobstructively view substantially the entire map so as to readily observe the relative distances between various locations on the map.

4,530,667

MARINE DRIVE SHIFT LINKAGE

Daniel F. McCormick, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 29, 1983, Ser. No. 566,654
Int. Cl.³ B63H *21/26*
U.S. Cl. 440—75 **14 Claims**



14. Drive engaging linkage for a marine drive lower gear case, comprising:

a propeller shaft rotatably mounted in said lower gear case;

drive gear means in said lower gear case for driving said propeller shaft;

clutch means axially slideable along said propeller shaft to engage said drive gear means for driving said propeller shaft;

a pre-assembled subassembly inserted into said gear case, and including:

operator controlled stalk means extending into said lower gear case and movable therein; and

linkage means comprising a pivoted member monted in said lower gear case at a pivot point on said subassembly and operatively coupled between said stalk means and said clutch means such that movement of said stalk means pivots said pivot member which moves said clutch means,

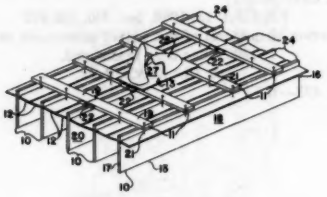
said subassembly, including said stalk means and said pivoted member, being inserted as a single unit into an assembled said gear case.

4,530,668

APPARATUS FOR WALKING UPON WATER

Henry D. Braun, 2421 84 Ave., S.E., Calgary, Alberta, Canada (T2C 0K7)

Filed May 30, 1984, Ser. No. 615,172
Int. Cl.³ A63C *15/03*
U.S. Cl. 441—76 **8 Claims**



1. A flotation device adapted to be worn on each foot of a person for enabling tne person to traverse the surface of a body of water, comprising:

(a) an array of vertically oriented horizontally elongated buoyant keel panels in parallel, spaced-apart juxtaposition defining elongated channels, said keel panels having straight upper edges which lie in coplanar disposition,

(b) at least two transverse members which pivotably engage the upper edges of said keel panels in a manner to permit adjustment of the spacing between the keel panels from a maximum spacing corresponding to the functional state of the device to a minimum spacing corresponding to the storage state of the device,

(c) at least one horizontally elongated buoyant flap disposed within each channel in hinged attachment with a keel panel adjacent the upper edge thereof and adapted for movement between a lowermost position wherein said flap lies flush against the panel to which it is attached, and an uppermost position wherein said flap is substantially perpendicularly disposed to said panel and constitutes a roof for said channel, and

(d) foot mounting means disposed above the upper edges of said keel panels and substantially centered within said array of keel panels.

4,530,669

METHOD OF MAKING A BORIDED DISPENSER CATHODE

Georg Gärtner, Aix-la-Chapelle, Fed. Rep. of Germany, and Egbert B. G. W. Gotjé, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 22, 1983, Ser. No. 468,224
Claims priority, application Netherlands, Mar. 5, 1982, 8200903
Int. Cl.³ H01J *9/04*
U.S. Cl. 445—51 **5 Claims**

1. A method of making a borided dispenser cathode of the type comprising a metallic base material containing a metal oxide emissive material which continuously diffuses to the cathode surface during operation, said metallic base material being capable of forming a boride compound when exposed to boron at the cathode's operating temperature,

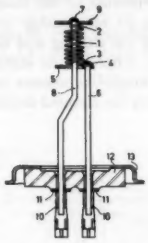
said method comprising the steps of:

(a) cleaning the cathode by annealing it in a hydrogen-containing atmosphere;

(b) depositing boron on the cathode by heating the cathode in an atmosphere containing a gaseous boron compound; and

(c) forming a boride of the metallic base material by heating

the cathode to its operating temperature in a nonreactive atmosphere and maintaining said temperature for a time



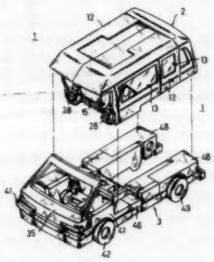
period sufficient to effect the reaction of deposited boron with the metallic base material.

4,530,670

RECONFIGURABLE TOY

Kouzin Ohno, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed Aug. 12, 1983, Ser. No. 522,822
Int. Cl.³ A63H *33/06*
U.S. Cl. 446—94 **5 Claims**



1. A reconfigurable toy comprising:

an upper housing assembly and a lower frame assembly that are removably connected together to form a configuration simulating a vehicle, the lower frame assembly includes a bifurcated frame member that respectively mounts a pair of pivotal side frame members that form the forward side portions of a vehicle in a first configuration and the arm appendages of a robot in a second configuration,

a pair of pivotal rear frame members that form vehicle underframe sections in a first configuration and robot feet in a second configuration and a front panel member that forms a front portion of the vehicle in a first configuration and an upper portion of the robot in a second configuration, the upper housing assembly includes a pair of pivotal side plates that form the sides and top of a vehicle body in a first configuration and a portion of the floor and side walls of a secondary vehicle in a second configuration, a pivotal rear panel that forms a rear portion of a vehicle body in a first configuration and a front portion of a secondary vehicle in a second configuration wherein the upper housing assembly can be removed to create a secondary vehicle or work station and the lower frame assembly can be converted into a robot.

4,530,671

TOY FIGURE WITH EXTENDING NECK

Mel Mednick, New City, and Karyn Weiss, New York, both of N.Y., assignors to L.J.N. Toys, Ltd., New York, N.Y.

Filed Jan. 28, 1983, Ser. No. 461,733
Int. Cl.³ A63H *3/36*
U.S. Cl. 446—320 **6 Claims**

1. A toy figure, comprising:

a body member;

a head member having an elongated neck and a skull, said skull having a heavy portion eccentrically positioned with respect to the axis of said neck to urge said neck into frictional engagement with said body member, said neck having first and second tab members on its longitudinal surface, said first tab member being positioned opposite said heavy portion; and

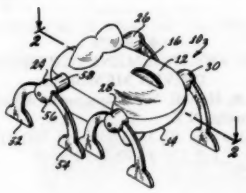
said body member having a bottom configured to stably support the figure in a generally upright position, a top orifice for slidably receiving said neck so that said neck can extend from and retract within said body member, a slot means extending generally longitudinally along a portion of said body member for engaging said first tab member and a stop means for restrainably engaging said second tab member when said neck is extended to a predetermined outermost extended position.

4,530,672

SUMMERSAULTING TOY

Yosuke Yoneda, Tokyo, Japan, assignor to Tomy Kogyo Company, Incorporated, Japan

Filed Apr. 20, 1984, Ser. No. 602,611
Claims priority, application Japan, Jun. 24, 1983, 58-97801[U]
Int. Cl.³ A63H *11/08*
U.S. Cl. 446—324 **15 Claims**



1. A walking toy which comprises:

a housing;

a motor located in said housing;

a first shaft and a second shaft each rotatably mounted on said housing and positioned parallel to one another, each of said shafts having ends projecting beyond the left and right sides of the housing;

connecting means connecting each of said first and said second shafts to said motor whereby said motor rotates each of said shafts with respect to said housing in the same constant direction of rotation;

first, second, third and fourth pedestal means, each of said respective pedestal means attaching to one of the respective ends of said first and said second shafts, said pedestal

means of a size and shape so as to extend beyond said housing and support said housing above a support surface;

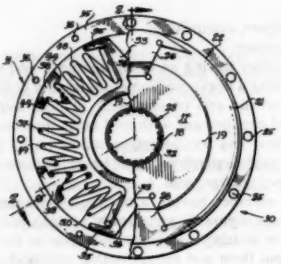
in response to said rotation of said shafts with respect to said housing, said housing rotating in a summersault like manner first about said first shaft with the pedestal means attaching to said first shaft supporting said housing and next about said second shaft with the pedestal means attaching to said second shaft supporting said housing.

4,530,673

SERIES SPRING VIBRATION DAMPERS

Paul E. Lamarche, Utica, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 30, 1983, Ser. No. 538,032
Int. Cl.³ F16D *3/14, 3/66*
U.S. Cl. 464—64 **10 Claims**



1. A vibration damper assembly to transmit torque between driving and driven elements, comprising an input member operatively connected to torque input means, a hub assembly operatively connected to torque output means and including at least two circumferentially equally spaced radial hub arms, said input means comprising a substantially enclosed housing journalled on said hub assembly and inwardly offset drive straps integral with said housing paralleling and axially aligned with said hub arms, an elongated bowed compression spring received in said housing and extending between the edges of adjacent hub arms and drive straps, and at least one wedge-shaped divider adapted to be inserted between adjacent coils of each said spring at a selected position to divide said bowed spring into two or more functioning spring segments.

4,530,674

COUPLING ARRANGEMENT FOR DRIVING AND DRIVEN MEMBERS

Burton S. Rauch, Howell, N.J., assignor to Allied Corporation, Morris Township, N.Y.

Filed Sep. 30, 1983, Ser. No. 538,031
Int. Cl.³ F16D *3/10, 3/50*
U.S. Cl. 464—75 **7 Claims**

1. A coupling arrangement for coupling metallic driving and driven shafts, characterized by:

the driving and driven shafts each having ends with longitudinally extending, harmonically varying female polygonal profiles;

a metallic coupling shaft, the ends of which each have longitudinally extending, harmonically varying male polygonal profiles corresponding to the female profiles of the ends of the driving and driven shafts;

the male profiles being crowned along their lengths; and

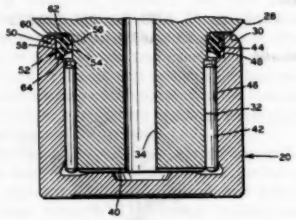
the crowned male profiles of the coupling shaft being received in sliding fit relationship by the corresponding female profiles of the driving and driven shafts for coupling said shafts, whereby the mating male and female profiles act in a hinge-like manner to accommodate misalignment between the coupled driving and driven shafts.

4,530,675

INTERNAL UNIVERSAL JOINT SEAL WITH MULTIPLE LIPS

Philip J. Mazziotti, Toledo, Ohio, assignor to The Zeller Corporation, Defiance, Ohio

Continuation-in-part of Ser. No. 467,131, Feb. 16, 1983,. This application May 23, 1983, Ser. No. 497,123
Int. Cl.³ F16D *3/26;* F16J *15/54*
U.S. Cl. 464—131 **12 Claims**

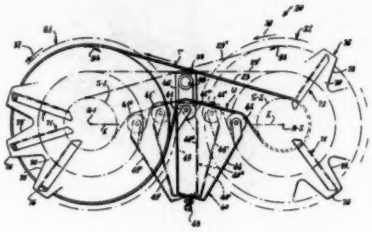


1. In combination, a cross having four trunnions and annular shoulders around said trunnions, each of said shoulders lying in a plane substantially perpendicular to an axis of the associated trunnion, a bearing cup for each of said trunnions, said bearing cup having an open end which receives the associated trunnion, said bearing cup having a first interior portion of circular cross section of one diameter adjacent the open end, said cup having a second interior portion of cylindrical shape of a smaller diameter away from said open end, with an internal shoulder formed between said portions, said cup shoulder lying in a plane substantially perpendicular to an axis of the cup, with the plane of said cross shoulder and the plane of said cup shoulder being substantially parallel, a universal joint seal for each of said bearing cups, said seal comprising a resilient sealing member having a first lip extending substantially radially inwardly and engaging the associated trunnion along a narrow, annular area, said sealing member having a second lip extending substantially radially inwardly and engaging the associated trunnion along a narrow, annular area, said sealing member having a third lip engaging the associated trunnion shoulder along a narrow, annular area, said sealing member having a fourth lip extending substantially radially outwardly generally opposite said first lip and engaging said first interior portion along a narrow, annular area, said sealing member having a fifth lip extending substantially radially outwardly generally opposite said second lip and engaging said first interior portion along a narrow, annular area, and said resilient sealing member having a sixth lip engaging the cup shoulder along a narrow, annular area, said third lip and said sixth lip extending in substantially opposite directions.

4,530,676
ADJUSTABLE-DRIVE-RATIO MULTIPLE-STEP BELT TRANSMISSION

Hamlin Leonard, 327 Hollow Tree Ridge Rd., Darien, Conn. 06820

Filed Feb. 28, 1983, Ser. No. 470,723
Int. Cl.³ F16H 9/10, 9/20
U.S. Cl. 474—49 49 Claims



1. An adjustable drive ratio multiple-step belt transmission comprising:

at least one pulley rotatable about an axis including a plurality of trackways each extending from respective inner positions nearer to the axis to respective outer positions farther from the axis,

a plurality of steps extending along in a sequence parallel to each respective trackway,

a plurality of belt-load-locking sheave segments adjustable in position along the respective trackways,

each sheave segment including gripping tooth means for engaging said sequence of steps for holding the sheave segment in its adjusted position,

each sheave segment including a belt-engaging portion offset from the centerline of said trackway in the circumferential direction toward which the dominant belt tension pulls when the transmission is running for causing belt loading on said offset belt-engaging portion of the sheave segment to exert torque in a predetermined direction on the sheave segment when the sheave segment is under belt loading,

said gripping tooth means being located on said sheave segment in a position for being urged in a predetermined direction by said torque resulting from said belt loading,

said sequence of steps being located on the side of the trackway toward which said torque urges said gripping tooth means, and

shift means engageable with the respective sheave segments when unloaded by the belt for shifting the unloaded sheave segments along the trackways for changing the effective diameter of the pulley for changing the drive ratio.

4,530,677
DERAILLEUR FOR A BICYCLE

Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Feb. 17, 1984, Ser. No. 581,048
Claims priority, application Japan, Feb. 22, 1983, 58-29046; May 9, 1983, 58-81428
Int. Cl.³ F16H 9/00, 11/00
U.S. Cl. 474—80 12 Claims

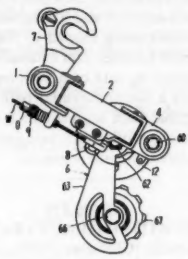
1. A derailleur for a bicycle for switching a driving chain from one sprocket to another of a multi-stage sprocket assembly which is mounted to the bicycle, said derailleur comprising:

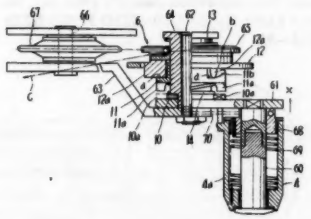
a base member,

a movable member movable axially of said multi-stage sprocket assembly,

first feeding means for moving said movable member axially of said multi-stage sprocket assembly by means of an outside manual operation, and

a guide mechanism supported to said movable member and including a guide pulley for guiding said driving chain to one sprocket of said multi-stage sprocket assembly and a tension pulley, said guide mechanism having a controller



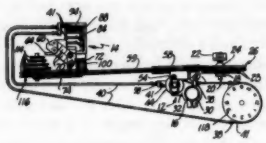


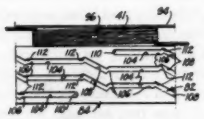
actuated by movement of said guide mechanism through operation of said first feeding means, said guide mechanism further comprising second feeding means for moving said chain axially of said multi-stage sprocket assembly in cooperation with movement of said driving chain positioned on said guide pulley.

4,530,678
DERAILER MECHANISM

Joseph W. Wechsler, 925 Enchanted Way, Pacific Palisades, Calif. 90272

Filed Jan. 12, 1984, Ser. No. 570,166
Int. Cl.³ F16H 9/24
U.S. Cl. 474—81 9 Claims





8. A cam intended for use in a derailer mechanism which cam includes a cylindrical member having a cam path means located so as to extend around its periphery in which the improvement comprises:

said cam path means comprising a plurality of circumferentially extending path segments located in planes perpendicular to the axis of said cylindrical member and diagonal path segments joining adjacent ends of said circumferential path segments so as to constitute a linear cam path having ends which extend around the periphery of said cylindrical member, and

extension means located at each junction between a circumferential path segment and a diagonal path segment, said extension means being shaped so that during rotation of said cylindrical member said extension means will cause a follower guided by said cam path means to move diagonally beyond a circumferential path segment in passing from a diagonal path segment to a circumferential path segment when the follower is being moved so as to engage said circumferential path segments.

4,530,679

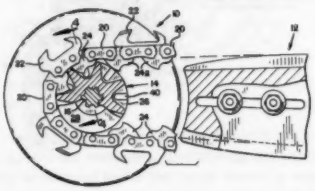
SPROCKET WITH RADIAL CLEARING MEANS

Michael J. Reynolds, Gladstone, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.

Continuation-in-part of Ser. No. 279,955, Jul. 2, 1981, abandoned. This application Jun. 27, 1983, Ser. No. 507,722

Int. Cl.[3] **F16H** *51/00, 7/06;* **B23D** *57/02;* **B27B** *17/08*

U.S. Cl. 474—92 **18 Claims**



1. A combination chain and drive sprocket wherein said chain comprises an elongate endless saw chain including a first pair of opposed laterally spaced side links, a second pair of opposed laterally spaced side links spaced longitudinally of the chain from said first pair, said side links having bottom support surfaces and outer side surfaces facing outwardly and away from the other side link in its associated pair with said outer side surfaces being spaced apart a preselected first distance, an elongate drive link interposed adjacent one of its ends between the side links of said first pair and adjacent its opposite end interposed between the side links of said second pair, and spaced first and second pivot means hingedly connecting said opposite ends of the drive link to said first and second pairs of side links, said drive link having a drive tang of preselected length and thickness which projects below the support surfaces of said side links, said sprocket comprising opposed side wall sections and a peripheral surface extending therebetween, said peripheral surface having tang-receiving pockets formed therein extending radially inwardly from the peripheral surface and bounded on opposite sides by said side wall sections, a pocket being at least the length of a drive tang and having a width greater than the thickness of said drive tang but less than said first distance, whereby said bottom support surfaces of the side links may rest on the peripheral surface adjacent the pocket, a pocket also having an enlarged clearing opening intermediate its ends, which clearing opening has a width greater than the width of remainder portions of said pocket and extends radially to open through said peripheral surface at a mouth which is wider than remainder portions of said pocket as measured axially of the sprocket and shorter than said drive tang as measured peripherally of said sprocket, said clearing opening being positioned to open into a space between said first and second pairs of side links when such chain is trained on said sprocket.

4,530,680

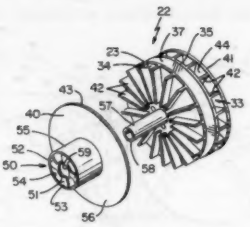
BELT PULLEY AND METHOD OF MAKING THE SAME

Joseph P. Miranti, Jr., Porter Township, Christian County, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Jun. 1, 1982, Ser. No. 383,855

Int. Cl.[3] **F16H** *57/04*

U.S. Cl. 474—93 **10 Claims**



1. In a V-belt pulley, adapted to drive a multi-pulley system, having a hub and a peripheral groove for receiving part of an endless belt therein that is to drive the other pulleys in the system, said V-belt pulley being adapted to be rotated about the axis of said hub, said pulley having means defining at least one passage means provided with an inlet adjacent said hub and an outlet adjacent said peripheral groove whereby fluid passing through said passage means from said inlet to said outlet thereof will tend to cool said pulley and/or said belt as said pulley rotates about said axis, the improvement comprising; a ventilating device on one side of said pulley comprising a substantially flat disk-like plate secured against a plurality of substantially flat and radially extending vanes integrally formed on said pulley, said vanes together with said plate defining said passages; said plate having attached thereto a rotatably operable fluid flow forcing means comprising a tubular member extending centrally from said pulley comprising a duct-like member having opposed ends, the first of said opposed ends of said duct-like member being disposed adjacent said inlet of said passage means, a rotatably operable fan comprising a plurality of fan blades having their outer ends secured to the inner peripheral surface of said tubular member, said fan blades being disposed in said duct-like member adjacent the other of said opposed end, and said fluid flow forcing means being carried by said pulley so as to be rotated and thereby operated in unison with said pulley; said plate having a central opening therethrough larger than the diameter of said axis to provide an enlarged opening leading to inlets of said passages associated with said plate; said fluid flow forcing means being disposed upstream from said inlets to said passages thus forcing through said passage means as said pulley and said fluid flow forcing means rotate about said axis, said pulley and ventilating devices being formed from a material having a high coefficient of heat conductivity.

4,530,681

CHAIN TENSIONER

Noboru Kurata, and Toshifumi Ito, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1983, Ser. No. 550,235

Claims priority, application Japan, Nov. 8, 1982, 57-195637

Int. Cl.[3] **F16H** *7/08*

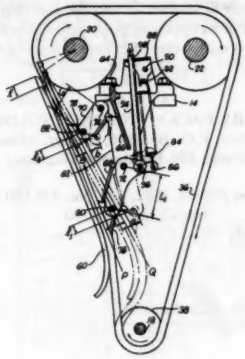
U.S. Cl. 474—111 **4 Claims**

1. A chain tensioner for an engine timing chain having a driving sprocket and a driven sprocket, comprising

a guide positioned adjacent the slack side of the chain;

first and second links supporting said guide, said links being spaced apart, said first link being adjacent the driving sprocket and said second link being adjacent the driven sprocket;

a spring coupled with said first link to bias said guide at said first link against the chain; and



said first and second links being of proportional extent such that the end of said guide adjacent the driven sprocket is tangent thereto.

4,530,682

TENSIONING ARRANGEMENT WITH A DAMPING DEVICE FOR A BELT DRIVE

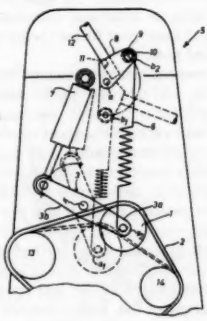
Gerhard Gruber, Auenwald; Peter Moser, Weinstadt; Ulrich Conrad, Ludwigsburg, and Jiri Vlach, Donzdorf, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 1, 1983, Ser. No. 470,781

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1982, 3208184

Int. Cl.³ F16H 7/12

U.S. Cl. 474—133 **12 Claims**



1. A tensioning arrangement for a belt drive comprising:

a tensioning roller support lever pivotably supported at a roller support pivot axle, said tensioning roller support lever exhibiting first and second lever arms extending in different directions from the roller support pivot axle,

a belt tensioning roller carried on the first lever arm,

a damping device connected with the second lever arm,

a pivotal spring tensioning lever including gripping handle accommodating means for accommodating a gripping handle,

and a tensioning spring having one end thereof connected to the first lever arm of the tensioning roller support lever and the other end thereof connected to the spring tensioning lever,

said spring tensioning lever being movable between a belt non-pretensioning position in which the belt is without pretensioning of the belt tensioning roller to a belt pretensioning position in which a predetermined belt pretensioning is applied to the belt by the belt tensioning roller.

4,530,683

DEVICE FOR PREVENTING SEPARATION OF A BELT FROM A MOTOR PULLEY

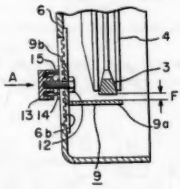
Shouzi Kasugai, Nagoya, and Tatsuya Sawato, Tajimi, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 2, 1983, Ser. No. 519,712

Claims priority, application Japan, Aug. 5, 1982, 57-119152[U]

Int. Cl.³ B62J 13/00

U.S. Cl. 474—144 **6 Claims**



1. A device for preventing separation of a belt from a motor pulley which comprises:

(a) a protection cover which covers a side portion of a pulley fixed to the output shaft of a motor and which is provided with a guide slot formed along the center line passing through the axial center of said output shaft;

(b) a belt separation preventing plate supported by a supporting body passing through said guide slot of said protection cover so as to be movable along said guide slot in a predetermined direction; and

(c) a retaining device for retaining said supporting body to fix said belt separation preventing plate to said protection cover by a spring pressure, wherein said belt separation preventing plate is adapted to be released from its engaging state caused by the spring pressure of said retaining device to thereby be movable along said guide slot.

4,530,684

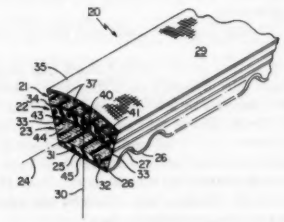
METHOD OF MAKING AN ARCHED ENDLESS BELT AND BELT MADE EMPLOYING THE METHOD

Joseph P. Miranti, Jr., Nixa, Mo., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 232,326, Feb. 6, 1981, Pat. No. 4,443,281. This application Dec. 19, 1983, Ser. No. 562,552

Int. Cl.³ F16G 1/00

U.S. Cl. 474—264 **11 Claims**



1. In an endless power transmission belt made primarily of polymeric material and comprising a tension section having an

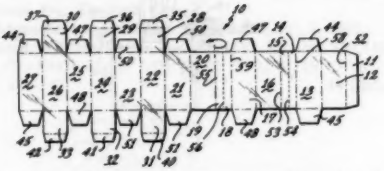
outer layer, a load carrying section, and a compression section having an outside surface, said belt having a longitudinal axis and its sections disposed in an arched configuration relative to said axis, the improvement comprising; a strip of comparatively soft gum material having an inwardly convex inner surface and a planar outer surface defining an outer portion of said compression section; said gum material serving as a crack barrier for said compression section and belt, and said gum material providing a base for said arched configuration of said tension, load carrying and compression sections.

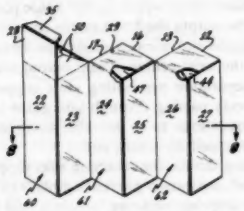
4,530,685

DISPLAY BOX ASSEMBLY

Sandra D. Freeman, 2733 W. Avenue 13, Los Angeles, Calif. 90065

Division of Ser. No. 284,722, Jul. 20, 1981, Pat. No. 4,382,344.
This application Feb. 17, 1983, Ser. No. 467,342
Int. Cl.³ B31B *1/62*
U.S. Cl. 493—151 **6 Claims**





1. A method for forming a series of corner connected boxes wherein each box in the series other than the end boxes has its diagonally opposite corners respectively joined to a corner of an adjacent box by a joining flap, said method comprising:

providing a unitary blank of sheet material which has been suitably cut and marked with parallel score lines to define along the length thereof body panels corresponding to the walls of said boxes, a plurality of pairs of narrow adjacent tabs, and a narrow flap on one end of said blank, each said pair of adjacent tabs disposed between two of the body panels forming a joining corner in said series of corner connected boxes;

moving said blank along a linear path with its inside surface facing upwardly;

forming a joining flap from each said pair of adjacent tabs by:

first folding an end portion of the blank that includes a pair of adjacent tabs inwardly on a scoreline whereat a tab in said pair connects to a body panel such that the outside surface of both tabs of said pair is facing upwardly;

applying glue to one tab of said pair of adjacent tabs, and

then refolding said end portion of the blank back outwardly on the scoreline whereat one tab connects to the other tab of said pair of adjacent tabs whereby the tabs are glued together to provide a joining flap;

folding said end flap inwardly at its scoreline;

applying glue to the joining flaps and said end flap; and

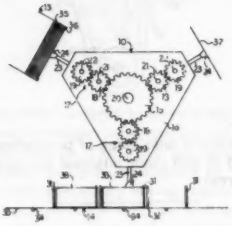
folding the blank such that half of the body panels are superimposed over the remaining half of the body panels thereon with each of the joining flaps respectively glued to the side portion of an opposing body panel forming a joining corner in said series and the end flap glued to the side portion of an opposing body panel forming a nonjoining corner in said series of corner connected boxes.

4,530,686

ROTARY PACKAGING TECHNOLOGY

William G. Everson, P.O. Box 145, Crosby, Minn. 56441, and Richard D. Stevens, 196 Harrington Dr., Long Lake, Minn. 55356

Filed Nov. 3, 1982, Ser. No. 438,780
Int. Cl.³ B31B *1/80*
U.S. Cl. 493—315 **20 Claims**



1. A rotary carton erecting apparatus to continuously transfer and open flat, folded cartons to and from radially disposed locations for subsequent packaging purposes, said apparatus utilizing a continuous rotary and orbital movement for the high speed, damage resistent transfer of packaging cartons, said carton erecting apparatus comprising:

(a) a rotary transfer mechanism having a fixed gear and a plurality of planetary gears in rotational communication with said fixed gear, said planetary gears having an inner idler gear and an outer drive gear, said inner gear being in rotational communication with said fixed gear and said outer gear being in rotational communication with said inner gear, said outer gear further being essentially smaller than said fixed gear,

(b) vacuum transport means to engage and disengage individual cartons, said transport means being in communication for rotational movement with said rotary transfer mechanism, said vacuum transport means further being in fixed rotational communication with each said outer gear of said planetary gears for providing orbital motion to the cartons transferred, said orbital motion of said vacuum means further providing at least two outwardly extending apex positions,

(c) vacuum control means being operative on said vacuum transport means, particularly at said apex positions,

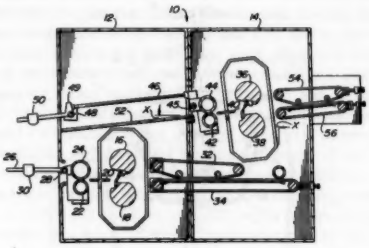
(d) storage means located at one said apex position for the releasable storage of flat, folded cartons, and,

(e) conveyor means having outwardly extending flights attached thereto, said flights being separated by a distance essentially based on a predetermined carton dimension, said conveyor means further being synchronized with said rotary transfer mechanism so that two adjacent conveyor flights are located at a predetermined location as said vacuum transport means approaches said second apex position, whereby, said rotary transfer mechanism with said vacuum control means operative on said vacuum transport means continually provides for the removal of individual, flat, folded cartons from said storage means at said first apex position, and provides for the continual opening of individual cartons into a sleeve-like configuration by causing flat, folded cartons to slidably engage said outwardly extending flights of said conveyor means located at said second apex position.

4,530,687
DUAL CUTOFF SYSTEM HAVING DIVERGING WEB PATHS

Thomas R. Keeny, Lindenwold, and William W. Harris, Jr., Turnersville, both of N.J., assignors to Molins Machine Company, Inc., Cherry Hill, N.J.

Filed Sep. 29, 1982, Ser. No. 426,520
Int. Cl.³ B65H 23/32
U.S. Cl. 493—361 10 Claims

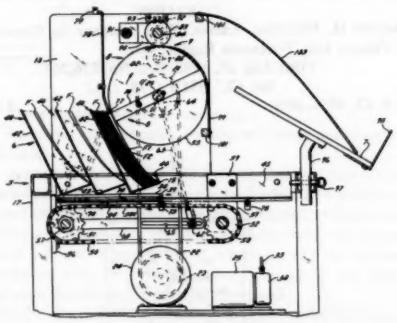


1. A dual cut off system comprising discrete upper and lower cut off units for cutting moving webs along an upper path and a lower horizontal web path, each web path including a discrete conveyor downstream from each cut off unit for conveying sheets along its associated path, the upper web path being inclined upwardly relative to the horizontal by an acute angle less than 15°, and the upper cut off unit being angled with respect to the vertical by an amount corresponding to said acute angle.

4,530,688
FILE FOLDER UNFOLDING MACHINE

Richard W. Gutowski, 110 Pecan Grove Dr., Hattiesburg, Miss. 39401

Filed Jun. 13, 1983, Ser. No. 503,805
Int. Cl.³ B31B 1/26
U.S. Cl. 493—409 8 Claims



8. In a machine for unfolding folded file folders having a frame:

A. a sucker member confined to rotation on said frame about a substantially horizontal axis and having a sucker surface which faces away from said axis and having a suction inlet that is connectable with a vacuum source;

B. means for rotating said sucker member in one direction about said axis to carry said sucker surface in an orbit that has a rear portion in which the sucker surface moves upward and an upper portion in which the sucker surface moves forward; and

C. magazine means for supporting a stack of folded file folders in substantially upright flatwise overlying relation to one another with their folds lowermost and substantially parallel to said axis and with a front surface of a front one of the folders tangent to said rear portion of said orbit to be attached to the sucker member by suction from said vacuum source and to be lifted and opened as the sucker surface moves through the rear and upper portions of its orbit, said magazine means having feed means to move the stack in said forward direction, through a distance substantially equal to the thickness of a folded file folder, each time a file folder is lifted from the stack;

D. and delivery means at said upper portion to engage an opened folder and to advance that folder edgewise forward to a position spaced from said orbit.

4,530,689
COMPUTER PAPER LOADING-AND-UNLOADING DEVICE

Billy R. Ringer, Sr., Houston, Tex., assignor to Crestmont Corporation, Houston, Tex.

Filed Dec. 9, 1982, Ser. No. 448,362
Int. Cl.³ B65H 45/00
U.S. Cl. 493—410 8 Claims

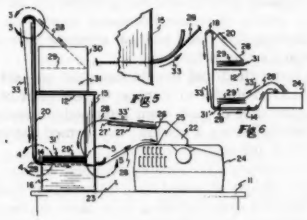


Fig 5

Fig 6

1. A stand for guiding continuous folded flat sheets to and from a sheet processing unit which has upper and lower sheet guides, the stand being adapted to become positioned rearwardly of and in a predetermined vertical position relative to said sheet guides;

the stand having a frame formed of a back plate, an upper shelf, and a lower shelf, which is vertically spaced apart from and vertically aligned with the upper shelf, the plate and the shelves together constitute supports and guides for the folded sheets as they are fed to the processing unit and as they become discharged therefrom after the processing operation;

said back plate extending downwardly across the planes of said upper and lower shelves, which are disposed forwardly of said plate and rearwardly of said processing unit;

the upper shelf, in use, supports a supply stack of folded paper sheets that are intended to be torn off in sections from the stack;

the lower shelf is in a plane below the rear end of the unit's lower sheet guide, and the top face of the lower shelf receives the returned sheets from said unit;

said back plate having an upper horizontal edge extending at a vertical distance above the plane of said upper shelf;

whereby, in use, the sheets unfold from the supply stack on the upper shelf, the unfolded sheets move upwardly, pass over the upper horizontal edge, thence move downwardly over the rear face of the back plate which guides and directs the forward motion of the sheets in a continuous manner underneath the bottom face of the lower shelf, the sheets exit from the stand and flow into the processing unit over its lower sheet guide, and the discharged sheets leave the processing unit over its upper sheet guide and discharge therefrom at a point above the bottom shelf and

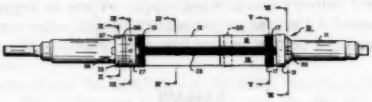
drop over the top face of the lower shelf where they refold into a flat stack of folded sheets.

4,530,690

NEWSPAPER FOLD ROLLER

Thomas L. Logan, Orland Park, Ill., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Oct. 17, 1983, Ser. No. 542,869
Int. Cl.³ B31F *1/10*; B60B *7/00, 11/00*
U.S. Cl. 493—442 **3 Claims**



1. An improved second fold roller construction for use in the production o. tabloid style newspapers, said roller comprising:

(a) an elongated roll adapted to be rotatably supported in suitable supporting framework, said roll having a main intermediate body portion of larger diameter than the remainder thereof;

(b) a margin ring formed adjacent one end of said intermediate body portion and rising above the surface thereof;

(c) a section of reduced diameter formed on the end of said intermediate body portion opposite that end where said margin ring is formed;

(d) semicylindrical inserts mounted on said section of reduced diameter to increase the diameter of said section to equal that of said main intermediate body portion, said inserts having a margin ring formed thereon which rises above the surface thereof;

(e) a crushing strip slidably disposed within a longitudinally extending slot in said main intermediate body portion, said crushing strip including (i) an outer surface that would be contained in an imaginary cylinder containing the outer surface of said margin rings, (ii) an outwardly extending flange on one end and (iii) a threaded portion on the opposite end of said crushing strip from said flange;

(f) a bar clamp slidably disposed within a longitudinally extending slot in said main intermediate body portion at a location diametrically opposed to the position of said crushing strip, said bar clamp being constructed identically to said crushing strip but having its outer surface substantially coterminous with the surface of said main intermediate body portion;

(g) a locking ring mounted on said semicylindrical inserts between the margin ring and the outwardly extending flanges on said crushing strip and said bar clamp; and

(h) an internally threaded locking ring threadably engaging said elongated roll shaft and the threads on said bar clamp and on said crushing strip whereby longitudinal movement of said bar clamp and said crushing strip can be effected in directions parallel to the axis of said roll shaft.

4,530,691

CENTRIFUGE WITH MOVABLE MANDREL

Richard I. Brown, Northbrook, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 13, 1983, Ser. No. 560,880
Int. Cl.³ B04B *1/06*
U.S. Cl. 494—45 **16 Claims**

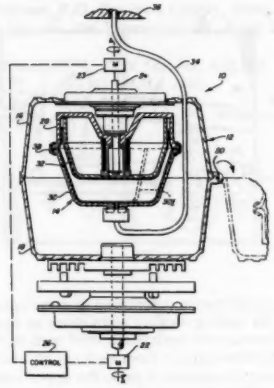
1. A centrifugal liquid processing apparatus comprising

a centrifuge bowl having an interior and being mounted for rotation about a spin axis,

a mandrel movable within a range of positions within said bowl interior between an extended position and a retracted position, said mandrel and bowl together defining the desired contours of the processing volume of said bowl, said desired contours varying in response to movement of said mandrel to accommodate a range of processing volumes varying between a minimum volume, when said mandrel is in said extended position, and a maximum volume, when said mandrel is in said retracted position,

a processing chamber positioned between said mandrel and said bowl, said chamber being flexible to accommodate the expansion and contraction of said chamber within said bowl in response to fluid pressure within said chamber,

conduit means for transporting fluid into and out of said processing chamber, and



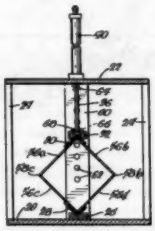
means for moving said mandrel within its range of positions in response to the expansion and contraction of said processing chamber and including means for biasing said mandrel toward said extended position to continuously force said flexible chamber into conformance with the desired contours of each of said processing volumes defined between said mandrel and said bowl in response to movement of said mandrel.

4,530,692

APPARATUS FOR OPENING FOLDED CORRUGATED CARTONS

Donald H. Williams, Adams, Wis., assignor to Consolidated Papers, Inc., Wisconsin Rapids, Wis.

Filed Aug. 25, 1983, Ser. No. 526,264
Int. Cl.³ B31B *1/78, 1/52*
U.S. Cl. 493—309 **3 Claims**



1. A device for opening a rectangular corrugated carton of a type which has score lines defining corners between side panels thereof and which is initially folded flat into generally rectangular form such that a first pair of score lines extend along opposite side edges of the flat carton and a second pair of score lines extend along opposite sides of the folded carton parallel to and intermediate the first pair, comprising first and second engaging means; means mounting said first and second

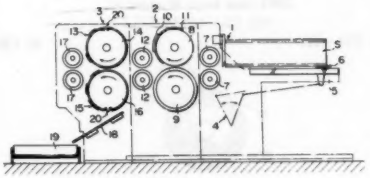
engaging means in spaced relationship and for movement toward and away from each other; and means coupled with said first and second engaging means for moving said first and second engaging means relative to and toward and away from each other, said first and second engaging means receiving opposite side edges of the folded carton when the same are moved away from each other and engaging and pressing against the carton side edges when the same are moved toward each other to move the first pair of score lines together and the second pair of score lines apart and to pivot the panels about the score lines to open the carton, wherein said moving means comprises motor means for moving said first and second engaging means toward and away from each other, said device including adjustment means for controlling said first and second engaging means to control the maximum and minimum spacings between said engaging means to accommodate opening folded cartons of various different sizes, said adjustment means including stop means for limiting movement of said first and second engaging means to be between said maximum and minimum spacings, and wherein said second engaging means is fixedly mounted and said first engaging means is moved by said motor means, and said stop means limits movement of said first engaging means to be between selected first and second positions with respect to said second engaging means.

4,530,693

DIE-CUTTING APPARATUS

Eiichi Isowa, Nagoya, Japan, assignor to Isowa Industry Co., Ltd., Nagoya, Japan

Filed Nov. 29, 1982, Ser. No. 445,220
Claims priority, application Japan, Nov. 30, 1981, 56-193377
Int. Cl.³ B26D *7/06*
U.S. Cl. 493—342 **1 Claim**



1. A die-cutting apparatus comprising:

(a) a feeder for continuously feeding out sheet materials or the like;

(b) a die cutter including a die cylinder having die-cutting blades arranged on its outer circumference in a predetermined shape and an anvil cylinder positioned to cooperate with said die cylinder, the sheet material from said feeder being cut into a product and waste by the die cutting blades on said die cylinder during passage of the sheet between the die and anvil cylinders; and

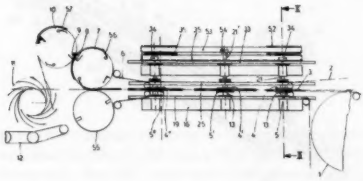
(c) a waste stripping unit including an upper roller having on its outer circumference a male die which corresponds to the waste of said sheet material, and a lower roller having on its outer circumference a female die which cooperates with the male die of said upper roller to exclusively separate said waste, while leaving said product, from said sheet material by squeezing the sheet material from said die cutter between said upper roller and said lower roller, said waste stripping unit further including differential means for adjusting the rotational phases of said upper roller and said lower roller with respect to the drive side of said waste separator, and the mutual rotational phase of said rollers.

4,530,694

SHEET, OR SHEET PACKAGE TRANSPORT AND ROTATION APPARATUS, AND METHOD

Ingo Köbler, Anhausen, and Godber Petersen, Augsburg, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Aug. 15, 1983, Ser. No. 523,198
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1982, 3230846
Int. Cl.³ B65G *17/32;* **B65H** *45/16*
U.S. Cl. 493—425 **11 Claims**



1. Sheet or sheet package transport and rotation apparatus having

means (**1**, **2**) for supplying a sheet or sheet package (**3**);

means (**6**, **7**) for removing the sheet, or sheet package, an endless belt means located between said supplying means and said removing means; and

means located downstream of said supplying means, including a transport path (**19**, **33**, **45**) for changing the orientation of the leading edge of the sheet or sheet package as it is being received from a sheet supply means, moved within said transport path, and delivered to the sheet or sheet package removal means with changed orientation of a reference edge of the sheet or sheet package;

comprising

two transport path guide rollers (**20**, **30**, **58**) guiding said endless belt means in said transport path;

a pair of superimposed endless gear belts looped about the transport path guide rollers;

a pair of superimposed aligned plates or disks (**4**, **5**) movable:

(a) away and towards each other to clamp the sheet, or sheet package between the disks or plates;

(b) rotatably about an axis transverse to the major surface of the disks or plates (**4**, **5**) to rotate the sheet or sheet package and thus change the orientation of the reference edge; and

(c) conjointly with said endless gear belts (**16**, **29**) in said transport path;

a cam means (**23**, **24**, **25**) extending lengthwise of said transport path coupled to at least one of said disks or plates and controlling movement toward and away from each other as the disks or plates move in said transport path;

the cam means controlling the respective position of the plates or disks with respect to each other for clamping and releasing the sheet or sheet package between the disks or plates;

an upper shaft (**21**) to which the upper one (**4**) of the plates or disks is secured;

and means for rotating the upper shaft (**21**) about a predetermined angle with respect to the transport path (**45**) to realign the reference edge of the sheet or sheet package, including

a gear (**34**);

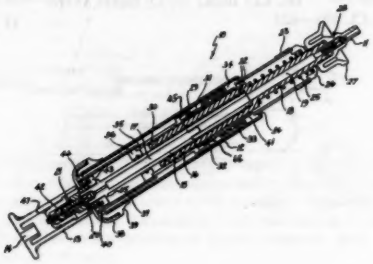
an endless gear belt (**35**) in engagement with said gear; and

motor and rotation transmission means (**37–42**, **36**) in engagement with said gear belt to rotate the gear belt and hence impart rotation to the shaft and hence to the upper plate or disk (**4**) as the upper plate or disk is being moved in said transport path.

4,530,695
INJECTOR

Ian R. Phillips, Killara; Mervyn F. Reynolds, Balgowlah, and Robert H. Lodge, Wheeler Heights, all of Australia, assignors to N.J. Phillips Pty. Limited, New South Wales, Australia

Filed Dec. 19, 1983, Ser. No. 563,030
Claims priority, application Australia, Dec. 31, 1982, PF7465
Int. Cl.³ A61M 5/00
U.S. Cl. 604—184 11 Claims



1. An injector comprising, an elongated hollow body, an interacting piston and cylinder mounted within the body and co-operating to provide a variable volume chamber with said piston or cylinder fixed to said body, a first passage extending from said chamber to one end of said body to communicate with an injection needle fixed to the body, a second passage extending from said chamber toward the other end of said body and to be connected to a reservoir of liquid to be delivered by said injector, valve means restricting said liquid to move through said injector from second passage to said first passage, spring means biasing said piston and cylinder to move relative to each other to minimise the volume of said chamber, retaining means to selectively prevent relative movement of said piston and cylinder to minimise said volume, and trigger release means movably mounted at said one end of said body and operatively associated with said retaining means to operate same upon movement of said trigger release means to permit relative movement between said piston and cylinder to thereby eject liquid through said first passage.

4,530,696
MONITOR FOR INTRAVENOUS INJECTION SYSTEM FOR DETECTING OCCLUSION AND/OR INFILTRATION

Jose Bisera, Camarillo, and Max H. Weil, Beverly Hills, both of Calif., assignors to Institute of Critical Care Medicine, Los Angeles, Calif.

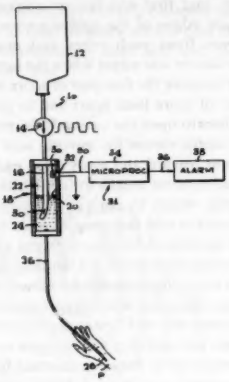
Filed Jun. 13, 1983, Ser. No. 503,410
Int. Cl.³ A61M 5/20
U.S. Cl. 604—253 6 Claims

1. In an intravenous injection system of the type that includes a pump which applies intravenous fluid to a pressure moderator, wherein the pressure moderator has a storage area including a gas-containing region above an intravenous fluid-holding region, and that also includes an outlet from said fluid-holding region for application through a needle or the like to a vein of a patient, the improvement of a monitor for detecting improper patient inflow including infiltration and/or occlusion, comprising:

a pressure sensor coupled to said storage area for sensing the pressure therein;

alarm means operable to generate an alarm signal indicating improper fluid flow; and

circuit means coupled to said pressure sensor and said alarm means, said circuit means responsive to the rate of change of pressure sensed by said pressure sensor, for operating said alarm means to generate an alarm signal upon the rate of change of said pressure exceeding a predetermined

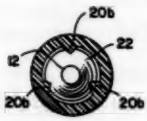


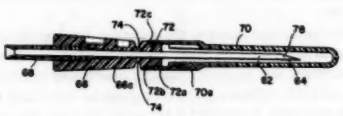
value over a predetermined period of time of more than 10 seconds.

4,530,697
NEEDLE ASSEMBLY

Bruce N. Kuhlemann, Hayward; Kalman Horvath, Concord, and Prentice C. Wharff, Oakley, all of Calif., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 386,549, Jun. 9, 1982, Pat. No. 4,435,177. This application Jan. 27, 1983, Ser. No. 461,325
The portion of the term of this patent subsequent to Mar. 6, 2001, has been disclaimed.
Int. Cl.³ A61M 5/32
U.S. Cl. 604—263 16 Claims





1. A needle assembly comprising a needle, a needle-retaining portion, a removable needle protector portion, and a resilient member for removing liquid from the surface of said needle, at least a portion of said liquid-removing member being contained within and removable with said needle protector portion and being positioned around a portion of, and disposed rearward of the point of, said needle, said liquid-removing member further having a needle-accommodating opening with an inner diameter approximately that of the outside diameter of the needle and outer cross sectional dimensions such that at least one of the dimensions is less than the internal cross sectional dimension of the protector, thereby providing a passageway for facilitating steam sterilization rearward of the liquid-removing member.

4,530,698

METHOD AND APPARATUS FOR TRAVERSING BLOOD VESSELS

Seth R. Goldstein, Bethesda, Md., and Robert Jones, Terre Haute, Ind., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Division of Ser. No. 22,219, Mar. 19, 1979,. This application Nov. 2, 1983, Ser. No. 530,067

Int. Cl.[3] A61M *25/00*

U.S. Cl. 604—271 20 Claims

14. A catheter assembly including:

a hollow member having one end formed with an opening;

an everting catheter tube having a forward end and a rearward end;

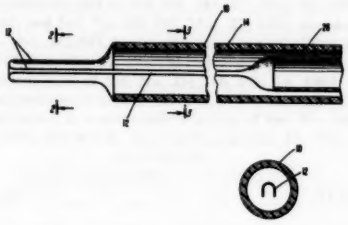
means securing said forward end proximate said opening in said hollow member;

wherein said tube is turned inside of itself from said forward end and extends back through said hollow member to form a radially inner section which becomes a radially outer section as the tube is everted from said opening;

support means for said tube attached to said rearward end of said tube, said support means being movable relative to said hollow member toward and away from said opening;

pressure applying means for supplying fluid under pressure to a space defined internally of said hollow member around said tube to evert said tube from said opening; and

means for minimizing contact and friction between said inner and outer sections during eversion of said tube, said



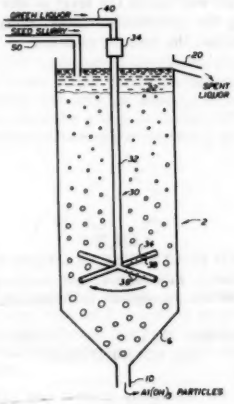
means for minimizing comprising a permanently set cross-sectional profile of said tube when not everted, said profile being such that said inner and outer sections are mutually spaced and have curved open-sided configurations, one within the other.

4,530,699

DENSE PHASE PRECIPITATION

Allen H. Schlesinger, New Athens, Ill.; L. Keith Hudson, Oakmont, Pa., and William M. Fish, Western Australia, Australia, assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jan. 18, 1979, Ser. No. 4,326
Int. Cl.[3] C30B 9/02
U.S. Cl. 23—301 7 Claims



1. A process for the precipitation of $Al(OH)_3$ from a supersaturated green liquor which comprises:

(a) feeding the supersaturated green liquor into the bottom of a precipitation chamber containing a suspension of liquor and seed particles;

(b) feeding seed particles of $Al(OH)_3$ into the top of said precipitation chamber at a rate sufficient to maintain a solids density in the seed suspension of from 500–1100 grams/liter in the chamber and a relatively unchanging seed bed suspension height;

(c) maintaining the flow of green liquor into the bottom of said reaction chamber at a velocity sufficient to maintain said seed particles in suspension while maintaining a liquor concentration gradient with respect to dissolved alumina within said chamber, the rate of flow of green liquor into the bottom of the chamber being preselected to maintain the $Al(OH)_3$ particles in suspension without the turbulence of a fluidized bed;

(d) recovering precipitated $Al(OH)_3$ from said chamber in the form of product having particles in the size range about between 50 and 150 microns; and

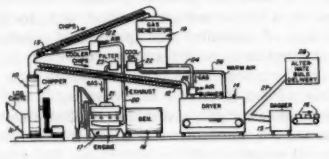
(e) overflowing spent liquor from the top of the precipitation chambers.

4,530,700

METHOD AND APPARATUS FOR USE IN PREPARING BIOMASS PARTICLES FOR FUEL AND FOR USE AS CHEMICAL FEED STOCK

Willard C. Sawyer; Edith M. Sawyer; Sherron M. Keef, and John W. Sawyer, all of R.F.D. #2, Oxford, Me. 04270

Continuation-in-part of Ser. No. 383,087, May 28, 1982, abandoned, and Ser. No. 360,197, Mar. 22, 1982, abandoned, said Ser. No. 383,087, is a continuation-in-part of Ser. No. 265,181, May 19, 1981, abandoned, which is a continuation-in-part of Ser. No. 231,376, Feb. 26, 1980, which is a continuation-in-part of Ser. No. 3,794, Jan. 16, 1979, abandoned, which is a continuation-in-part of Ser. No. 848,511, Nov. 4, 1977, abandoned. This application Feb. 15, 1984, Ser. No. 580,334
Int. Cl.[3] C10L 9/08, 11/08; C10J 3/46
U.S. Cl. 44—1 E 51 Claims



1. The method of preparing harvested wood, bark and like biomass material for consumption as a fuel or chemical feed stock where control of particle size and moisture content are requirements, said method consisting of the steps of utilizing particles produced from the harvested material at or near the harvesting site or other remote sites with substantially all of the particles having a moisture content too high for most economical use, providing a path to a gas producing station for particles, providing particles for said station of sizes produced by conventional chippers and delivering said particles to said station along said path, subjecting the conveyed particles to gasification at that station to provide at least one stream of hot fuel gas, delivering particles to a drying station of sizes produced by conventional chippers and hoggers, utilizing the hot fuel gas in said one stream to dry the particles at said station by introducing ambient air into and burning the fuel gas in a manner to reduce the temperature of the resulting hot products of combustion to an extent enabling the moisture content of the particles at the drying station to be reduced without affecting them adversely for their wanted consumption thereby to effect at least one of said requirements and establishing the relationship between the conveyed particles and the delivered particles that results in the moisture content of the particles at the drying station being reduced to a desired extent in the approximate range of from five to forty percent and delivering the thus dried particles to a consumption site.

32. Apparatus for preparing wood, bark and like biomass materials at or near the site or sites where they are harvested in the form of particles for consumption as a fuel or chemical feed stock where control of particle size and moisture content are requirements with substantially all of the particles having a moisture content too high for most economical use, said apparatus including a drying section, means to deliver particles thereto of sizes produced by conventional chippers and hoggers, a gas producing section including at least one gas generating means operable to consume particles and produce hot fuel gas, means to deliver particles to said gas generating means of sizes produced by conventional chippers, means to introduce ambient air into and means to burn the major portion of said hot fuel gas and to deliver the hot products of combustion to said drying section at a temperature suitable for there reducing the moisture content of particles without adversely affecting their use for the wanted consumption, said generating means of a type enabling a total hot fuel gas production to be attained with a volume of particles less than the volume of particles dried thereby with the ratio between the two volumes such

that the moisture content of the particles is reduced to a wanted extent in the approximate five to forty percent range.

4,530,701

PROCESS OF MANUFACTURING A CO-FUEL ADDITIVE WITH COMBUSTION-MODIFYING EFFECTS

Larry P. Koskan, Orland Park, Ill.; Roger W. Kugel, Winona, Minn., and George T. Kekish, Naperville, Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation of Ser. No. 378,756, May 17, 1982, abandoned. This application Oct. 20, 1983, Ser. No. 543,818

Int. Cl.³ C10L *1/32*

U.S. Cl. 44—51 **10 Claims**

1. The process of manufacturing a co-fuel composition wherein the suspension of coal macroparticles in a petroleum fuel liquid is promoted during transportation and storage and wherein the solid and gaseous products resulting from the combustion of the co-fuel are modified, said process comprising the steps of: providing a composition of petroleum fuel oil and powdered coal; mixing a coal anti-sedimentation surfactant with a petroleum liquid that is miscible with said petroleum fuel oil and thereafter incorporating in said surfactant mixture a quantity of pulverulent alkaline fluxing mineral material and a quantity of water which is sufficient to form a water-in-oil emulsion with said petroleum liquid and which is sufficient to take up said fluxing mineral material into the enclosed, water phase of said emulsion; and adding said surfactant/mineral mixture to said composition of oil and coal.

4,530,702

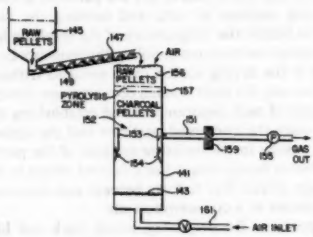
METHOD FOR PRODUCING FUEL GAS FROM ORGANIC MATERIAL, CAPABLE OF SELF-SUSTAINING OPERATION

Wayne A. Fetters, Canby, and Donald E. Chittick, Newberg, both of Oreg., assignors to Pyrenco, Inc., Prosser, Wash.

Continuation of Ser. No. 178,179, Aug. 14, 1980, abandoned. This application Mar. 1, 1982, Ser. No. 353,570

Int. Cl.³ C10J *3/14*

U.S. Cl. 48—209 **11 Claims**



1. A continuous process for producing fuel gas from biomass input material in which the production and consumption of charcoal is substantially in balance, the process comprising the steps of:

Establishing a gas production bed in a single reaction chamber which has an outlet means for fuel gas, the production bed comprising in sequence (a) an upper layer of biomass input material, (b) an intermediate pyrolysis zone layer in which the input material is reduced to devolatilized char and pyrolysis volatiles comprising hydrogen, carbon monoxide, water vapor and tars, the intermediate layer being at a temperature within the range of 800 degrees C. to 100 degrees C., and (c) a lower layer comprising substantially only hot charcoal, the hot charcoal being at a temperature which is sufficiently high to reduce any tars from the pyrolysis zone layer to carbon monoxide and hydrogen;

Adding biomass input material to the top of the upper layer as the input material in the upper layer is consumed during the process;

Moving oxygen-containing gas downwardly through the gas production bed to sustain the pyrolysis reaction in the intermediate layer and to maintain the temperature of the charcoal in the lower layer, wherein the pyrolysis volatiles from the intermediate layer move downwardly through the hot charcoal in the lower layer, resulting in tar-free fuel gas, which exits from the outlet means;

Moving additional oxygen-containing gas upwardly through the lower layer, the additional oxygen-containing gas reacting with the hot charcoal in the lower layer to produce additional tar-free fuel gas, which exits from the outlet means, as well as consuming hot charcoal in the lower layer; and

Regulating the introduction of the additional oxygen-containing gas so that the level of charcoal comprising the lower layer, and hence the level of the pyrolysis zone comprising the intermediate layer, remain substantially constant within the reaction chamber.

4,530,703

CROSS-LINKED POLYARYLENE OXIDE MEMBRANES

Raymond F. Malon, Edmundson, and Anthony Zampini, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 30, 1983, Ser. No. 509,636

Int. Cl.³ B01D *53/22*

U.S. Cl. 55—16 **13 Claims**

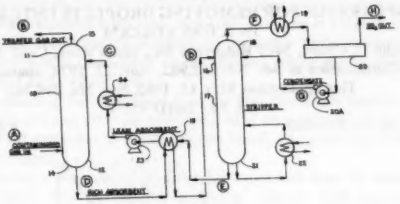
1. A process for separating at least one gas in a gaseous mixture from at least one other gas in said gaseous mixture by selective permeation and providing a permeating product containing at least one permeating gas, comprising: contacting the gaseous mixture with one side of a gas separation membrane having a asymmetric wall structure with a thin dense skin, said skin having pores, and said membrane having a coating in occluding contact with the pores of the thin dense skin, which with respect to at least one pair of gases of said gaseous mixture, the gas separation membrane exhibits selective permeation of one gas of said pair of gases over that of the remaining gases, the gas separation membrane is comprised of a covalently bonded cross-linked polymer of a polyarylene oxide precursor of 2,6-dimethyl-1,4-phenylene oxide having substituent groups selected from the group consisting of benzylic halogen at from 0.01 to 2.0 halogen atoms per phenylene oxide unit, halogenated acetyl at from 0.01 to 1.0 halogenated acetyl groups per phenylene oxide unit and halogenated propionyl at from 0.01 and 1.0 halogenated propionyl groups per phenylene oxide unit; and a chemical cross-linking agent selected from the group consisting of ammonia and aqueous solution of ammonia hydroxide; maintaining the opposite surface of the gas separation membrane at a lower chemical potential for said at least one permeating gas permeating said at least one permeating gas into and through the gas separation membrane; and removing from the vicinity of said opposite surface a permeated product having a different portion of said at least one gas.

3. A gas separation membrane comprising a covalently bonded cross-linked polymer of a polyarylene precursor, the precursor having at least 0.01 substituent per arylene oxide unit wherein said substituent is selected from the group consisting of a halogenated alkyl group and a halogen acyl group; and a chemical cross-linking agent selected from the group consisting of ammonia and a solution of ammonia.

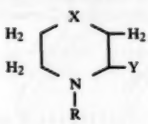
4,530,704
SELECTIVE ABSORPTION OF SO_2 FROM GASES CONTAINING THE SAME

Mark B. Jones, and Allan E. Fowler, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 19, 1983, Ser. No. 562,771
Int. Cl.³ B01D 47/00
U.S. Cl. 55—48 7 Claims



1. A method for removing sulfur dioxide from a gas stream containing the same which comprises contacting the sulfur dioxide containing gas with an aqueous solution of a compound selected from the group consisting of a piperazinone and/or morpholinone having the following general formula

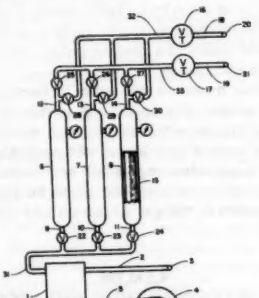


wherein X represents the oxygen, or =NR', Y represents oxygen or H_2, and each of R represent an independently selected lower alkyl moiety of 1 to 5 carbon atoms, and recovering the gas, substantially free of said sulfur dioxide, from said aqueous solution.

4,530,705
CYCLIC GAS SEPARATOR

Joseph C. Firey, P.O. Box 15514, Seattle, Wash. 98115

Filed Apr. 16, 1984, Ser. No. 600,841
Int. Cl.³ B01D 53/04
U.S. Cl. 55—162 12 Claims



1. A cyclic gas separator machine for separating mixed gases and comprising:

at least one compressor means for compressing gases from a lower pressure to a higher pressure and each such compressor means comprising at least one stage and each such stage comprising an inlet and an outlet end;

at least two separate expander means for expanding gas from a higher pressure to a lower pressure and each such expander means comprising at least one stage and each such stage comprising an inlet end and a discharge end;

at least three separate container means, each of said containers comprising, an elongated gas pressure vessel means for containing any gas compressed therein, an inlet at one end of said pressure vessel, an outlet at the other end of said pressure vessel, at least one type of surface force material, means for positioning said surface force material inside said gas pressure vessel means so that gas can flow through said pressure vessel means from said inlet to said outlet and so that when gas flows into said pressure vessel inlet and also when gas flows out of said pressure vessel outlet, such gas flow occurs essentially unidirectionally across most of the surface of said surface force material;

power means for driving each said compressor means and for absorbing any mechanical work done upon each said expander means by said expanding gas;

each such expander means comprising an expander discharge;

at least one mixed gas supply source of gas to be separated;

a number of separate product gas collector pipes equal to said number of separate expander means;

each such compressor means whose number of stages exceeds one further comprising fixed open gas flow connections from the outlet end of each compressor stage, except one, to the inlet end of one other stage of said compressor, whereby said stages of said compressor are connected in series so that the pressure of a particular gas mass, at delivery from each stage, increases as said gas mass is compressed through said series connected stages, from the inlet end to the outlet end of each stage, with the first stage in said series through which a gas mass first flows being both the lowest pressure stage and also that one stage whose inlet end does not have a fixed open gas flow connection from the outlet end of any other stage of said compressor, and with the last stage in said series through which a gas mass last flows being both the highest pressure stage and also that one stage whose outlet end does not have fixed open gas flow connection to the supply end of any other stage of said compressor;

fixed open gas flow connections from the inlet end of the lowest pressure stage of each of said compressor means to said mixed gas supply source;

each such separate expander means whose number of stages exceeds one further comprising fixed open gas flow connections from the discharge end of each expander stage, except one, to the inlet end of one other stage of said expander, whereby said stages of said expander are connected in series so that the pressure of a particular gas mass, at discharge from each stage, decreases as said gas mass is expanded through said series connected stages, from the inlet end to the discharge end of each stage, with the first stage in said series through which a gas mass first flows being both the highest pressure stage and also that one stage whose inlet end does not have a fixed open gas flow connection from the discharge end of any other stage of said expander, and with the last stage in said series through which a gas mass last flows being both the lowest pressure stage and also that one stage whose discharge end does not have a fixed open gas flow connection to the inlet end of any other stage of said expander;

fixed open gas flow connections from the discharge end of the lowest pressure stage of each of said expander means to said expander discharge;

expander discharge means for connecting the discharge of each of said separate expander means separately to but one of said product gas collector pipes with a fixed open gas flow connection so that each product gas collector pipe is thusly connected to but one of said separate expander discharges;

changeable container gas flow connections, which are openable and closeable, from the gas pressure vessel inlet of each of said containers to each outlet end of each stage of each of said compressor means, and from the gas pressure vessel outlet of each of said containers to each inlet end of each stage of each of said expander means;

each cyclic gas separator machine comprising a number of said containers, with changeable gas flow connections to said compressor means and to said expander means, at least equal to the sum of the number of compressor stages of all compressors and the number of expander stages of all expanders;

means for opening and closing said changeable gas pressure vessel gas flow connections so that each gas pressure vessel inlet is opened for a time period to each outlet end of each stage of each of said compressor means, in a sub-sequence of time periods of open gas flow connections to compressors, said sub-sequence proceeding in time order of increasing compressor stage delivery pressure, each gas pressure vessel outlet is opened for a time period to each inlet end of each stage of each of said expander means, in a sub-sequence of time periods of open gas flow connections to expanders, said sub-sequence proceeding in time order of decreasing expander stage inlet pressure, said sub-sequence of connections to said compressors being followed by said sub-sequence of connections to said expanders, and these together comprise one sequence of time periods of open gas flow connections, each of said gas pressure vessel changeable gas flow connections is opened to only one stage during any one time period of said sequence of time periods, said sequence of time periods of open gas flow connections to said compressor means and to said expander means is repeated for each of said containers by said means for opening and closing;

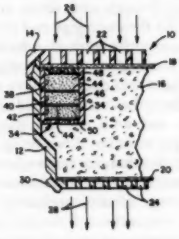
means for controlling said means for opening and closing said changeable gas pressure vessel gas flow connections, so that said repeated sequences of time periods of open gas flow connections are a continuous series of time periods for any one containing means, and so that the delivery end of each stage of each compressor means has an open gas flow connection to one gas pressure vessel inlet, and the inlet end of each stage of each expander means has an open gas flow connection to one gas pressure vessel outlet, during all time periods, whenever said machine is operating.

4,530,706

RESPIRATOR CARTRIDGE END-OF-SERVICE LIFE INDICATOR

John A. Jones, Wilbraham, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Oct. 19, 1981, Ser. No. 312,201
Int. Cl.³ B01D *50/00*
U.S. Cl. 55—275 **9 Claims**



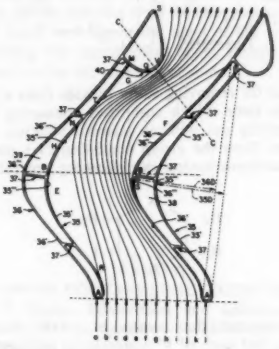
1. In a respirator cartridge having a covered shell with oppositely disposed upstream and downstream perforated sides for passage of air therethrough, the combination of an adsorbent for an organic vapor/gas supported between said perforated sides and an end-of-service life indicating system within said adsorbent adjacent said upstream side of said shell including an indicator characterized to undergo a change of color concomitant with exposure to concentrations of organic vapors and gases which are below a threshold limit known to be safe to inhale, said indicating system including the improvement of molecular sieve material between said indicator and said perforated upstream side of said covered shell with said sieve material adjoining said indicator for adsorbing molecules of matter within a range of molecular size including those of H_2O while permitting passage of larger molecules of organic vapors and gases for rendering said larger molecules passed through adaptable to intimate contact with said indicator and immediate reaction therewith.

4,530,707

APPARATUS FOR REMOVING DROPLETS ENTRAINED IN A GAS STREAM

John C. Ovard, 3465 Ridgeview Dr., Santa Rosa, Calif. 95404

Continuation of Ser. No. 962,982, Nov. 22, 1978, abandoned.
This application May 13, 1983, Ser. No. 494,362
Int. Cl.³ B01D *45/06*
U.S. Cl. 55—440 **5 Claims**



1. A mist eliminator for removing droplets of liquid entrained in a gas stream comprising:

a plurality of longitudinally extending eliminator blades positioned in side by side spaced apart relation for passing a gas stream through the space between adjacent blades from an inlet to an outlet,

each blade having an inlet inclined section and an outlet inclined section,

said inlet and said outlet inclined sections having opposite slope and connected by an intermediate transition section thereby establishing a convex surface on the bottom of each of said blades ad a concave surface on the top surface of each of said blades,

convex surface means on said outlet inclined section of said concave surface only on the top surface of each of said blades continuous with said concave surface on the top surface of each of said blades and projecting outwardly such that a stagnation region will be provided toward the inlet from said convex surface means for impingement of water droplets in the gas stream on said convex surface means.

4,530,708

AIR SEPARATION METHOD AND APPARATUS THEREFOR

Norio Nakazato; Sachihiro Yoshimatsu; Makoto Nawata, and Sadao Masuda, all of Kudamatsu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 13, 1983, Ser. No. 494,448
Claims priority, application Japan, May 14, 1982, 57-79932
Int. Cl.³ F25J *3/04*
U.S. Cl. 62—13 **4 Claims**

1. A method of separating air comprising the steps of:

compressing feed air so as to pressurize the same;

cooling the compressed feed air with pure vaporous nitrogen, pure gaseous oxygen, and waste gas rich in nitrogen from a single rectification column;

delivering the cooled feed air to the single rectification column;

subjecting the delivered cooled feed air to an indirect heat exchange with liquid oxygen at a bottom of the single rectification column so that the liquid oxygen is vaporized while the feed air is condensed so as to be liquified;

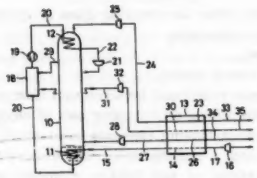
further cooling the liquified feed air to a level sufficient to condense and liquify pure vaporous nitrogen in the single rectification column;

subjecting the further cooled liquified feed air to an indirect heat exchange with pure vaporous nitrogen at a top of the single rectification column so that the pure vaporous nitrogen is condensed to be liquified while the liquified feed air is vaporized;

introducing the vaporized feed air into the single rectification column after the vaporized feed air is pressurized to a level sufficient to condense and liquify the pure vaporous nitrogen;

forming a mixture by joining the vaporized feed air introduced into the single rectifying column with oxygen vapor from the vaporization of the liquid oxygen at the bottom of the single rectification column whereby the mixture of oxygen vapor and feed air rising as an upwardly flowing vapor in the single rectification column comes into a vapor-liquid contact with the liquified nitrogen to result in a separation into pure vaporous nitrogen at the top of the single rectification column and pure liquid oxygen at the bottom of the single rectification column; and

withdrawing the pure gaseous nitrogen from the top of the single rectification column, pure gaseous oxygen from the



bottom of the column and waste gas from an intermediate portion of the column.

3. An air separator comprising:

an air compressor means for compressing feed air;

a heat exchanger means for cooling the feed air compressed by said air compressor means;

a single rectification column means for performing an air separation;

a first condenser means accommodated in the single rectification column means at the bottom thereof for vaporizing liquid oxygen and for condensing and liquifying the feed air by indirect heat exchange between liquid oxygen at the bottom of the single rectification column and the compressed feed air cooled by said heat exchanger means;

means for further cooling and reducing the pressure of the liquified air to a temperature necessary for the condensation and liquification of pure vaporous nitrogen inside said single rectification column means;

a second condenser means accommodated in the single rectification column means at the top thereof for condensing and liquifying pure vaporous nitrogen and for vaporizing the liquified feed air by indirect heat exchange between the further cooled liquified feed air and pure vaporous nitrogen in the single rectification column means;

a second compressor means for introducing into the single rectification column means feed air vaporized by said second condenser means after the feed air has been pressurized to the pressure necessary for the condensation and liquification of the pure vaporous nitrogen inside said single rectification column by said second condenser means.

4,530,709

METHOD FOR PRODUCING OPTICAL FIBER

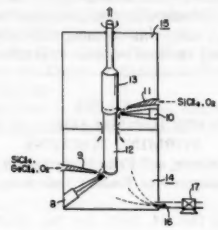
Kazufumi Ogawa, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 10, 1983, Ser. No. 550,548

Claims priority, application Japan, Nov. 16, 1982, 57-201461; Mar. 14, 1983, 58-41759; Mar. 14, 1983, 58-41760

Int. Cl.³ C03B *25/02*

U.S. Cl. 65—3.12 **13 Claims**



1. A process for producing an optical fiber, comprising the steps of:

heating the bottom end of a substantially vertically oriented glass rod in a gas atmosphere with converging light beams wherein said gas atmosphere consists of a gaseous substance for forming a component vitreous material which is completely free of hydrogen gas, said material being thereby precipitated and deposited on the end of said glass rod;

moving said glass rod upward at a speed determined by the rate of deposition of said material to form a preform of the core of said optical fiber; and

heating the side of said core preform in a gas atmosphere with converging light beams to form a clad preform on the surface of said core preform.

4,530,710

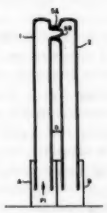
LOW-PRESSURE ARC DISCHARGE LAMP HAVING PARALLEL DISCHARGE TUBES WITH AN ARC-CONTAINING INTERCONNECTING CHANNEL; AND METHOD OF MANUFACTURING SAME

Leonard V. Dullea, Peabody; Frederick A. Loughridge, Ipswich, and Stephen G. Johnson, Georgetown, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Oct. 24, 1983, Ser. No. 544,669

Int. Cl.³ C03D *33/06*; H01J *9/00*

U.S. Cl. 65—56 **9 Claims**



1. A method of manufacturing a low-pressure arc discharge lamp having at least two substantially parallel glass discharge tubes where each tube is closed at one end and connected to an adjacent tube by a hermetically sealed arc-containing channel extending transversely to the walls of said discharge tubes, said method comprising the steps of:

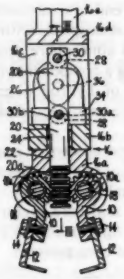
(a) positioning said tubes substantially in parallel with a predetermined spacing therebetween;
(b) applying heat means at a preselected location on the wall of each tube so as to provide a first softened site on said first tube facing a second softened site on said second tube;
(c) blowing said first softened site outwardly from the inside of said first tube to form a first glass bubble that bursts on said second softened site; and
(d) thereafter blowing said second softened site outwardly from the inside of said second tube to form a second glass bubble which fuses with said first glass bubble and bursts into said first tube, thus forming said hermetically sealed arc-containing channel between said tubes.

4,530,711

TAKE-OUT MECHANISM FOR A GLASSWARE FORMING MACHINE

Hermann H. Nebelung, and Fritz Futterknecht, both of Zurich, Switzerland, assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Oct. 31, 1984, Ser. No. 666,598
Claims priority, application United Kingdom, Nov. 16, 1983, 8330574
Int. Cl.³ C03B 9/44
U.S. Cl. 65—260 **9 Claims**



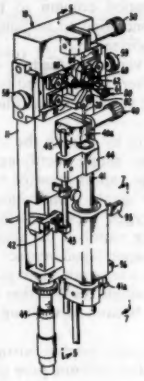
1. A take-out mechanism operable to remove articles from a mould of a glassware forming machine, the mechanism comprising two gripper member supports on which gripper members are mounted for movement towards one another into a gripping condition thereof or away from one another into releasing condition thereof, a carrier on which each gripper support is mounted for pivoting movement about a horizontal axis to move the gripper member mounted thereon between its gripping and releasing conditions, operating means operable to pivot the gripper member supports as aforesaid, and moving means operable to move the carrier between a first position thereof at which the gripping members can grip an article and a second position thereof at which the gripping members can release the article on to a support, the operating means comprising an operating rod mounted on the carrier for longitudinal movement in a vertical direction, and driving means operable to move the operating rod in the vertical direction, the operating rod being connected to the gripper member supports so that, when the operating rod is moved in the vertical direction, the gripper member supports are caused to pivot as aforesaid, wherein the driving means comprises a cam mounted on the carrier which engages two opposed surfaces of the operating rod, and motor means operable to turn the cam through a preselected angle about a horizontal axis which passes between the opposed surfaces, the profile of the cam being such that, when the motor means moves the cam through the preselected angle, the operating rod is caused to move downwardly and, when the motor means next moves the cam through the preselected angle, the operating rod is caused to move upwardly, and, throughout its movement through the preselected angle, the cam has a constant extent along a line joining points of contact thereof with the opposed surfaces so that the cam maintains contact with both opposed surfaces.

4,530,712

PIPETTE PULLER

J. David Kopf, 7324 Elmo St., Tujunga, Calif. 91042

Filed Mar. 26, 1984, Ser. No. 593,261
Int. Cl.³ C03B 23/11
U.S. Cl. 65—270 **20 Claims**



1. A pipette puller for drawing glass or quartz tubing into micropipettes comprising:
a first clamp,
a movable clamp means,
furnace means positioned between said clamps, said furnace means comprising an opposing pair of elongated, electrical resistance heating elements substantially transversely of said tube, a heating zone defined between said elongated portions of said heating elements such that said tubing is heated by radiation and convection,
whereby when the drawing temperature of said tubing is reached in said heating zone, said movable clamp means draws one end of said tubing relative to the other end in a predetermined manner to produce a tapered and hollow micropipette having a tip diameter of less than ten microns.

4,530,713

UREA-FORMALDEHYDE FERTILIZER SUSPENSIONS

James H. Williams, Louisville, Ky., assignor to Borden, Inc., Columbus, Ohio

Filed Jul. 25, 1983, Ser. No. 517,040
Int. Cl.³ C05C 9/00
U.S. Cl. 71—28 **35 Claims**

1. A process for preparing an aqueous suspension of a urea-formaldehyde condensation product which comprises:
(a) adding urea to an acidic solution of formaldehyde at a pH not above about 1.75 at a temperature between about 50° C. and about 98° C. to form a condensate having a mole ratio of formaldehyde to urea of about 3.5:1 to 2.6:1;
(b) adjusting the reaction mixture of (a) above, to a pH of about 5.2 to about 6.8 and adding further urea while said mixture is at a temperature of about 75° C. to about 92° C. until the mole ratio of formaldehyde to urea is about 0.5:1 to 1.8:1, and permitting the condensation to continue until the reaction mixture has a nephelometric turbidity reading in the range of 200 to 800 NTU units; and then
(c) neutralizing the reaction mixture to a pH of about 7.1 to 8.5.

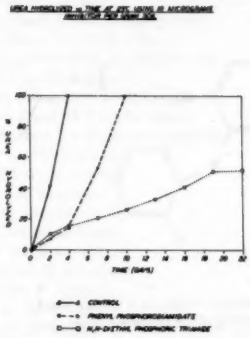
4,530,714
N-ALIPHATIC AND N,N-ALIPHATIC PHOSPHORIC TRIAMIDE UREASE INHIBITORS AND UREASE INHIBITED UREA BASED FERTILIZER COMPOSITIONS

Jaroslav F. Kolc, Morristown; Michael D. Swerdloff, Parsippany; Milorad M. Rogic, Whippany, all of N.J.; Larry L. Hendrickson, Camillus, and Michael Van Der Puy, Cheetowaga, both of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

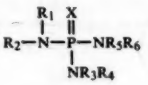
Continuation-in-part of Ser. No. 475,987, Mar. 16, 1983, abandoned. This application Jan. 16, 1984, Ser. No. 571,226

Int. Cl.³ C05C *9/00*

U.S. Cl. 71—28 **52 Claims**



1. A composition comprising an acceptable carrier and a urease inhibiting effective amount of one or more phosphoric triamide compounds of the formula:



wherein:

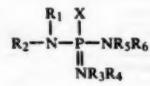
X is oxygen or sulfur;

R_1 is alkyl, cycloalkenyl, alkenyl, alkynyl, aralkyl or cycloalkyl;

R_2 is R_1, hydrogen, or R_1 and R_2 together may form an alkylene or alkenylene chain which may optionally include one or more heteroatoms of oxygen, nitrogen, or sulfur completing a 3, 4, 5, 6, 7 or 8 membered ring structure; and

R_3, R_4, R_5 and R_6 are individually hydrogen or alkyl having from 1 to about 4 carbon atoms.

48. An improved fertilizer composition which comprises urea and/or one or more compounds capable of forming urea under the use conditions of said composition and a urease inhibiting effective amount of one or more phosphoric triamide compounds of the formula:



wherein:

X is sulfur and oxygen;

R_1 is alkyl, cycloalkenyl, alkenyl, alkynyl, aralkyl or cycloalkyl;

R_2 is hydrogen, R_1, or R_1 and R_2 together may form an alkylene or alkenylene chain which may optionally include one or more heteroatoms of oxygen, nitrogen, or sulfur completing a 3, 4, 5, 6, 7 or 8 membered ring structure; and

R_3, R_4, R_5 and R_6 are individually hydrogen or alkyl having from 1 to about 4 carbon atoms.

4,530,715
CYCLOALKYL (α-TRIAZOLYL-β-HYDROXY)-KETONES AS FUNGICIDES AND PLANT GROWTH REGULATORS

Eckart Kranz, Wuppertal; Karl H. Büchel, Burscheid; Udo Kraatz, Leverkusen; Erik Regel, Wuppertal; Wilhelm Brandes, Leichlingen; Paul-Ernst Frohberger, Leverkusen, and Klaus Lürssen, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

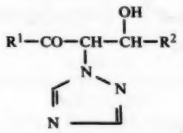
Filed Nov. 2, 1982, Ser. No. 438,448

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1981, 3145846

Int. Cl.³ A01N *43/64, 55/02;* C07D *249/08;* C07F *3/00*

U.S. Cl. 71—76 **12 Claims**

1. A cycloalkyl(α-triazolyl-β-hydroxy)-ketone of the formula



in which

R^1 is cyclopropyl or 1-methyl-cyclopropyl, and

R^2 is a trichloromethyl, dichlorofluoromethyl, trifluoromethyl, dichloromethyl, chloromethyl, 1,1,2-trichloroethyl, 1,1-dichloroethyl, 1,1-dibromoethyl, 1,1-dichloropropyl, 1,1-dichlorobutyl, 1,1,2-trichloropropyl, 2-chloroprop-2-yl, 1,2,2-trichlorovinyl, 2,2-dichlorovinyl or 1,1-dichloro-2-methyl-propyl group,

or an addition product thereof with a physiologically acceptable acid or a metal salt.

7. A fungicidal or plant-growth regulating composition, comprising a fungicidally or plant-growth regulating effective amount of a compound or addition product according to claim **1** in admixture with a diluent.

4,530,716
OXIME ETHERS, COMPOSITIONS CONTAINING THEM AND THE USE THEREOF

Henry Martin, Allschwil, and Urs Fricker, Gelterkinden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

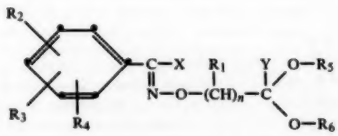
Filed Mar. 10, 1983, Ser. No. 473,905

Claims priority, application Switzerland, Mar. 15, 1982, 1609/82

Int. Cl.³ A01N *43/00;* C07D *317/00*

U.S. Cl. 71—88 **37 Claims**

1. An oxime ether of the formula



wherein

n is 1 or 2;

each of R_1 and R_2 is hydrogen or C_1–C_4 alkyl;

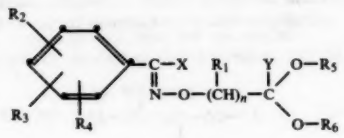
each of R_3 and R_4 is hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy or nitro;

R_5 and R_6 together form a 2-membered alkylene or alkenylene bridge which may be substituted by 1 or 2 C_1–C_4 alkyl groups;

X is a fluorinated C_1–C_3 alkyl radical which may also additionally contain chlorine; and

Y is hydrogen, C_1–C_4 alkyl or C_1–C_4 alkoxy.

17. A composition for controlling weeds in crops of culture plants which comprises (a) a herbicidally effective amount of a herbicide selected from the group consisting of thiocarbamates, haloacetanilides, phenoxyphenoxypropionates, pyridyloxyphenoxypropionates and dinitroanilines, and (b) as crop safening agent an oxime ether of the formula



wherein

n is 1 or 2;

each of R_1 and R_2 is hydrogen or C_1–C_4 alkyl;

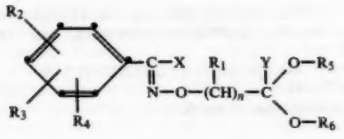
each of R_3 and R_4 is hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy or nitro;

R_5 and R_6 together form a 2-membered alkenyl or alkenylene bridge which may be substituted by 1 or 2 C_1–C_4 alkyl groups;

X is a fluorinated C_1–C_3 alkyl radical which may also additionally contain chlorine; and

Y is hydrogen, C_1–C_4 alkyl or C_1–C_4 alkoxy.

19. A method of protecting rice, sorghum, wheat and maize crops from the phytoxic action of thiocarbamate, haloacetanilide, phenoxyphenoxypropionate pyridyloxyphenoxypropionate or dinitroaniline herbicides, which comprises adding to the herbicides, applying to the locus of the crops, or applying to the seeds of said crops, as antidote, a compound of the formula



wherein

n is 1 or 2;

each of R_1 and R_2 is hydrogen or C_1–C_4 alkyl;

each of R_3 and R_4 is hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy or nitro;

R_5 and R_6 together form a 2-membered alkylene or alkenylene bridge which may be substituted by 1 or 2 C_1–C_4 alkyl groups;

X is a fluorinated C_1–C_3 alkyl radical which may also additionally contain chlorine; and

Y is hydrogen, C_1–C_4 alkyl or C_1–C_4 alkoxy, in a plant-protecting amount.

4,530,717

SYNERGISTIC HERBICIDAL MIXTURES OF SUBSTITUTED PHENYLSULFONYLUREA DERIVATIVES AND BENZTHIAZOL-2-YL-OXYACETIC ACID N-METHYLANILIDE

Masahiro Aya; Kazuomi Yasui, and Atsumi Kamochi, all of Tokyo, Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

Filed Jan. 18, 1983, Ser. No. 459,011

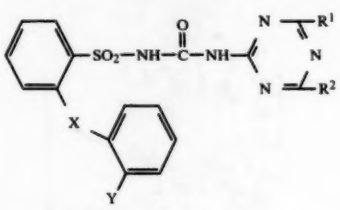
Claims priority, application Japan, Jan. 22, 1982, 57-7453

Int. Cl.[3] **A01N** *43/02, 43/66*

U.S. Cl. 71—90 **7 Claims**

1. A herbicidal composition consisting essentially of a herbicidally effective amount of

(1) a substituted phenylsulfonylurea derivative of the formula



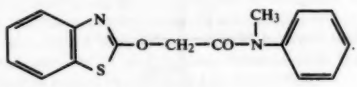
in which

X is an oxygen atom or a direct bond,

Y is a hydrogen or chlorine atom, and

R^1 and R^2 each independently is a methyl group or a methoxy group, plus

(2) about 1 to 5 times its weight of benzthiazol-2-yloxyacetic acid N-methylanilide of the formula



4,530,718

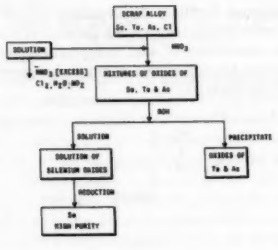
PROCESS FOR RECLAMATION OF HIGH PURITY SELENIUM FROM SCRAP ALLOYS

Santokh S. Badesha, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 29, 1984, Ser. No. 594,626

Int. Cl.[3] **C01B** *19/02;* **C22B** *3/00*

U.S. Cl. 75—121 **8 Claims**



1. A process for the reclamation of selenium from scrap alloys which comprises converting the alloy into a mixture of oxides, separating the selenium oxide formed by alcoholic dissolution, followed by treating the resulting solution with a reducing agent selected from the group consisting of hydra-

zine, sulfur dioxide, hydroxylamine, hydroquinone, thioureas, phosphites, formic acid, ascorbic acid, and glyoxal; and thereafter separating the selenium product therefrom.

4,530,719
AUSTENITIC STAINLESS STEEL FOR HIGH TEMPERATURE APPLICATIONS

Gerald D. Johnson, Kennewick, and Roger W. Powell, Pasco, both of Wash., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

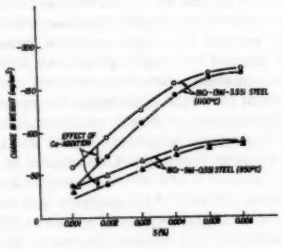
Filed Apr. 12, 1983, Ser. No. 484,322
Int. Cl.³ C22C *38/40*
U.S. Cl. 75—124 **10 Claims**

1. An austenitic stainless steel alloy consisting essentially of:
0.02 to 0.08 wt.% carbon;
about 1.5 to about 2.5 wt.% manganese;
about 0.5 to about 1.0 wt.% silicon;
between 0.02 and 0.08 wt.% phosphorus;
0.004 to 0.010 wt.% sulphur;
about 12.5 to about 14.5 wt.% chromium;
about 14.5 to about 16.5 wt.% nickel;
about 1.5 to about 2.5 wt.% molybdenum;
0.02 to 0.05 wt.% aluminum;
0.002 to 0.008 wt.% boron;
0.1 to 0.4 wt.% titanium;
up to 0.01 wt.% zirconium;
0.02 to 0.05 wt.% niobium;
0.01 to 0.05 wt.% vanadium;
0.005 to 0.02 wt.% tantalum;
0.01 to 0.04 wt.% copper;
up to 0.01 wt.% nitrogen;
up to 0.01 wt.% oxygen;
0.02 to 0.05 wt.% cobalt;
up to 0.03 wt.% arsenic;
the balance being essentially iron with impurities;
and wherein the sum of the wt.% phosphorus plus the wt.% sulphur plus the wt.% boron is greater than 0.03 wt.%;
and wherein the ratio of the wt.% Ti to the sum of the wt.% carbon plus the wt.% nitrogen is between 4 and 6.

4,530,720
HIGH TEMPERATURE OXIDATION RESISTANT AUSTENITIC STEEL

Taishi Moroishi, Kobe; Hisao Fujikawa, Nishinomiya; Junichiro Murayama, Takarazuka, and Yuji Shoji, Ashiya, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka and Nippon Stainless Steel Co., Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 313,239, Oct. 21, 1981, abandoned, which is a continuation of Ser. No. 101,865, Jun. 8, 1979, abandoned. This application Nov. 21, 1983, Ser. No. 553,875
Claims priority, application Japan, Oct. 12, 1977, 52-122836
Int. Cl.³ C22C *38/38*
U.S. Cl. 75—128 A **24 Claims**



1. An austenitic steel, said austenitic steel having improved resistance to oxidation at temperatures above 700° C. and consisting essentially of the following alloying elements:
C: not greater than 0.10%
Si: more than 1%, but not greater than 5.0%
Mn: not greater than 3.0%
Ni: 7–15%
Cr: 15–20%,
the amounts of said alloying elements being adjusted to result in an austenitic microstructure, and
a balance of iron and impurities of which sulfur is restricted to not greater than 0.003%.

4,530,721
LITHOGRAPHIC FOUNTAIN CONCENTRATE

Gerard H. Kinderman, St. Paul, Minn., and James F. Sanders, Hudson, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 20, 1983, Ser. No. 533,927
Int. Cl.³ C09K *3/00*; C08K *3/34*
U.S. Cl. 106—2 **7 Claims**

1. A lithographic concentrate capable of being diluted with water to provide a lithographic fountain solution comprising from about 1.0 to about 15.0 percent by weight of a polyacrylic acid having a weight average molecular weight of less than about 30,000 and from about 0.25 to about 3.0 percent by weight of colloidal silica, based on silica solids.

4,530,722
BINDER AND REFRACTORY COMPOSITIONS AND METHODS

John R. Moore, Florham Park, and Stephen Maybaum, Short Hills, both of N.J., assignors to Harborchem, Inc., Livingston, N.J.

Continuation-in-part of Ser. No. 478,457, Mar. 24, 1983, abandoned, which is a continuation-in-part of Ser. No. 433,959, Oct. 13, 1982, abandoned. This application Aug. 22, 1983, Ser. No. 525,423
Int. Cl.³ B28B *7/34*
U.S. Cl. 106—38.35 **38 Claims**

1. A binder composition which is the result of combined ingredients comprising colloidal silica, a liquid material containing Si-OH groups, a solvent which is capable of solubilizing the liquid material and the colloidal silica, and at least one aprotic, non-ionic, non-metallic organic compound which contains at least one element selected from the group consisting of phosphorus, sulfur, boron, nitrogen, and mixtures thereof and which stabilizes the binder composition against self-gelling, wherein said colloidal silica and said liquid material are present in a ratio by weight of from about 1:12 to about 75:1 respectively, said liquid material has at least 20% by weight SiO_2, and said colloidal silica contains at least about 15% by weight of SiO_2, and wherein said solvent and said organic compound are present in amounts so as to solubilize the liquid material and the colloidal silica, to provide a binder composition which is stable against self-gellation, and to provide a binder composition which gels to a single phase.

11. A refractory composition comprising refractory particles and a binder composition, wherein said binder composition is the result of combined ingredients comprising colloidal silica, a liquid material containing Si-OH groups, a solvent which is capable of solubilizing the liquid material and the colloidal silica, and at least one aprotic, non-ionic, non-metallic, organic compound which contains at least one element from the group consisting of phosphorus, sulfur, boron, nitrogen, and mixtures thereof and which stabilizes the binder composition against self-gelling, wherein said colloidal silica and said liquid material are present in a ratio by weight from about 1:12 to about 75:1 respectively, said liquid material contains at least about 20% by weight SiO_2, and said colloidal silica contains at least 15% by weight of SiO_2, and wherein said solvent and said organic compound are present in amount sufficient to solubilize the liquid material and the colloidal silica, to provide a binder composition which is stable against self-gellation, and to provide a binder composition which gels to a single phase.

4,530,723

ENCAPSULATION OF ION EXCHANGE RESINS

Eugene E. Smeltzer, Salem Township, Westmoreland County, and Michael C. Skriba, Plum Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 472,527, Mar. 7, 1983, abandoned. This application Nov. 4, 1983, Ser. No. 549,123

Int. Cl.[3] C04B 7/35

U.S. Cl. 106—90 15 Claims

1. A process for encapsulating in cement an ion exchange resin aqueous mixture containing about 1 to about 30% dissolved solids, comprising adding to said mixture:

(A) about 1 to about 3% of a fouling agent;

(B) a sufficient amount of a basic accelerator to raise the pH to at least 7; and

(C) sufficient cement for a water to cement weight ratio of about 0.4 to 1 to about 0.6 to 1.

4,530,724

AZO PIGMENTS DERIVED FROM 2-HYDROXYNAPHTHALENE-3-CARBOXYLIC ACID OR ITS SALTS HAVING IMPROVED COLOR

Ryuzo Ueno, Nishinomiya; Hiroaki Tsuchiya, Kobe, and Shigeru Itoh, Nishinomiya, all of Japan, assignors to Kabushiki Kaisha Ueno Seiyaku Uno Kenkyujo, Osaka, Japan

Filed Sep. 1, 1982, Ser. No. 413,797

Claims priority, application Japan, Sep. 8, 1981, 56-140365

Int. Cl.[3] C09B 29/01, 29/15; C06P 1/44

U.S. Cl. 106—288 Q 3 Claims

1. An azo pigment derived from 2-hydroxy-naphthalene-3-carboxylic acid or its salts, which comprises the azo pigment obtained by reacting a mixture composed of (1) 2-hydroxy-napthalene-3-carboxylic acid or its salt, (2) β-naphthol or its salt and (3) a phenolic by-product having a molecular weight of about 300 and containing about 1 equivalent of phenolic hydroxy groups, said phenolic by-product being obtained by evaporating β-naphthol from a tarry substance formed as a by-product obtained during the reaction of an alkali β-naphtholate with carbon dioxide, extracting the residue with an alkali, and precipitating the soluble matter with an acid, with a diazonium compound of an aromatic aminosulfonic acid.

4,530,725

PREPARATION OF THERMALLY STABLE LEAD CHROMATE PIGMENTS

Werner Ostertag, Gruenstadt; Peter Dimroth, Mannheim; Henning Wienand, Neulussheim; Egon Liedek, Esslingen; Helmut Knittel, Ludwigsburg, and Günter Etzrodt, Stuttgart, all of Fed. Rep. of Germany, assignors to BASF Farben and Fasern Aktiengesellschaft, both of Hamburg, Fed. Rep. of Germany

Filed Jun. 28, 1984, Ser. No. 625,604

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1983, 3323247

Int. Cl.[3] C08K 3/00

U.S. Cl. 106—298 3 Claims

1. A process for the preparation of a thermally stable lead chromate pigment, or pigment containing lead chromate, which has a high color strength and is provided with a precipitated coating containing silicon dioxide, wherein an aqueous pigment suspension is mixed with an aqueous $MgSiF_6$ solution, the pH being maintained at 4.5–9.5 and the temperature at 50°–95° C. and the pigment is then separated off and worked up, these steps being carried out in a conventional manner.

4,530,726

FINGERNAIL REFINISHING PRODUCT AND METHOD

Alexandra Montiel, 639 Bushwick Ave., Brooklyn, N.Y. 11206

Continuation-in-part of Ser. No. 301,457, Sep. 14, 1981, abandoned. This application Apr. 4, 1983, Ser. No. 481,736

Int. Cl.[3] B08B 7/00; A45D 29/00; A61K 7/04

U.S. Cl. 134—6 20 Claims

1. Fingernail refinishing product for simultaneously removing fingernail polish, conditioning cuticles, fingernails and fingertips, and depositing a clear prime coat on fingernails, which comprises a fingertip-treating liquid composition contained within applicator means, said applicator means comprising:

a reclosable container dimensioned so that when said container is open, at least one fingertip at a time may be inserted for treatment therein; and

porous resilient absorbent means, substantially filling said reclosable container, said absorbent means being saturated with said fingertip-treating liquid composition, said liquid composition comprising:

at least one solvent means for fingernail polish removal;

proteinaceous means for providing fingernail-strengthening qualities to said liquid composition;

at least one film-forming means for depositing a clear prime coating on the fingernails to be treated; and

at least 10 weight percent of an emollient means consisting essentially of a reaction product of castor oil with sulfuric acid, the natural ricinoleic acid of said castor oil having been converted into a buffered sulfonate derivative.

4,530,727

METHOD FOR FABRICATING WROUGHT COMPONENTS FOR HIGH-TEMPERATURE GAS-COOLED REACTORS AND PRODUCT

Larry D. Thompson, and William R. Johnson, Jr., both of San Diego, Calif., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Feb. 24, 1982, Ser. No. 351,876

Int. Cl.[3] C22F 1/02

U.S. Cl. 148—2 16 Claims

1. A method of fabricating a high-temperature high-strength, carburization-resistant structural component of a high-temperature gas-cooled reactor, said component having a predetermined shape, comprising:

forming an alloy consisting essentially of between 0 and about 10 percent by weight chromium, between about 0.02 and about 0.1 percent by weight carbon; between about 0 and 0.2 percent by weight zirconium; between 0 and about 0.2 percent by weight niobium; between 0 and about 0.2 percent by weight vanadium; between 0 and about 0.2 percent by weight tantalum; between 0 and about 0.2 percent by weight of hafnium, at least one of zirconium, niobium, vanadium, tantalum and hafnium being present for forming carbides, the sum of the contents of zirconium, niobium, vanadium, tantalum and hafnium totaling between about 0.02 and about 0.2 weight percent; between 0 and about 20 percent by weight of tungsten; between 0 and about 20 percent by weight of molybdenum, the sum of the tungsten and molybdenum contents totaling between about 6 and about 20 percent by weight; aluminum and titanium, the sum of the aluminum and titanium contents totaling between about 1 and about 5 percent by weight, the ratio of the percentage by weight of aluminum to the percentage by weight of titanium being between about 0.5 and about 2, balance nickel and incidental impurities not detrimental to malleability,

strength and carburization resistance at temperatures up to 1050° C.;

working the alloy into the predetermined shape; and

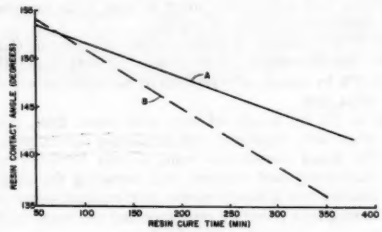
exposing said worked alloy to an atmosphere having an oxidation potential of between about 10^{-21} and about 10^{-23} atmospheres at a temperature of between about 850° C. and about 1050° C., whereupon a titanium-stabilized aluminum oxide coating is formed on the surface of said worked alloy that protects said alloy from subsequent carburization.

4,530,728

EXPANDING EMBEDMENT RESIN FOR COMPOSITE-MODIFIED DOUBLE-BASE PROPELLANTS

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 7, 1984, Ser. No. 669,146
Int. Cl.³ C06B *45/10*
U.S. Cl. 149—19.6 **2 Claims**



1. An embedment system with controlled shrinkage for use with a composite-modified double-base propellant composition, said embedment system comprised of an embedment granule portion (A) which comprises ingredients (i–viii) in percent by weight as follows:

(A) embedment granule portion:

(i) nitrocellulose: 23.0;

(ii) nitroglycerine 8.8–13.8;

(iii) triacetin: 1.2;

(iv) bisspiro orthocarbonate: 2.5–5.0;

(v) resorcinol: 1.5;

(vi) 2-nitrodiphenylamine: 1.0;

(vii) ammonium perchlorate (10 micrometers weight-mean-diameter particle size) 48.5; and,

(viii) aluminum powder (20 micrometers weight-mean-diameter particle size): 10.0; and, an embedment resin portion (B) which comprises ingredients (i–iii) in percent by weight as follows:

(B) embedment resin portion:

(i) bisphenol A epichlorohydrin: 50.0

(ii) epoxidized dimer acid: 50.0

(iii) curative: 15.0 comprised of equal parts mixture of

methylenedianiline

m-phenylenediamine and

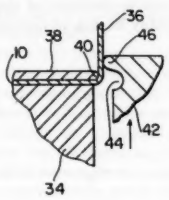
i-propyl-m-phenylenediamine with an added accelerator of 2,4-dinitrophenol.

4,530,729

FOLDING OF FLAT SHEET TO EXACT INTERIOR HEIGHT

Gilbert Fuchs; Norman Crowley, and Randall Wink, all of Evansville, Ind., assignors to Evans Tool & Engineering Inc., Evansville, Ind.

Division of Ser. No. 270,873, Jun. 5, 1981, Pat. No. 4,415,325.
This application Aug. 26, 1983, Ser. No. 526,830
Int. Cl.³ B29D *23/10*
U.S. Cl. 156—217 **5 Claims**



1. A method for making a fold in a flat sheet with the folded sheet having an exact interior height comprising the steps of:

positioning a flat shim having a folding edge on the flat sheet with the edge of the shim located along the line where the fold in the sheet is to be made, the shim having a thickness corresponding to that desired for the interior height of the folded sheet;

initially folding a portion of the sheet approximately 90° by tangentially bending the portion of the sheet on the folding edge; and

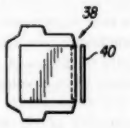
pushing a die having a facing edge mating with the folding edge onto the shim and the portion of the sheet located therebetween such that the fold of the portion of the sheet is completed to approximately 180° whereby an exact interior height adjacent the fold is provided.

4,530,730

METHOD OF MAKING ENVELOPE ASSEMBLIES

William P. Bradley, Hollidaysburg, Pa.; Michael Herman, Bedford Hills, and Robert W. Paltrow, Bedford, both of N.Y., assignors to Bedford Engineering Co., Armonk, N.Y.

Filed Feb. 7, 1983, Ser. No. 464,648
Int. Cl.³ B65B *11/48*
U.S. Cl. 156—227 **13 Claims**



1. A high speed method for producing a plurality of mailing assemblies each such mailing assembly comprised of an envelope and an enclosure consisting of the following steps;

a. providing a plurality of blanks of sheet material with each blank being comprised of an envelope portion having at least two flap sections and an enclosure portion;

b. separating said plurality of blanks one at a time so that formation of each discrete blank into an envelope with an enclosure can be accomplished rapidly one after the other;

c. applying adhesive on each of said blanks having tack when wet and no tack when dry;

d. folding said enclosure portion of a single blank upon said envelope portion of said blank to form a double thickness of sheet material with said enclosure portion covering substantially all of said envelope portion with the exception of three

edges of said envelope portion including said two flap sections wherein one thickness represents said envelope portion and the other thickness represents said enclosure portion;

e. separating said enclosure portion from said envelope portion to form two discrete pieces of sheet material and retaining said double thickness of material;

f. applying adhesive material to predetermined areas on said envelope portion;

g. folding said two flap sections of said envelope portion not covered during the step d. folding step; and

h. folding said double thickness of sheet material to form an envelope assembly having an enclosure.

4,530,731

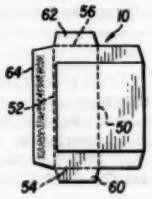
HIGH SPEED METHOD OF MAKING ENVELOPES EACH WITH A SEPARATE ENCLOSURE

William P. Bradley, Hollidaysburg, Pa., assignor to Bedford Engineering Co., Armonk, N.Y.

Filed Jan. 5, 1984, Ser. No. 568,547

Int. Cl.³ B65B *11/48*

U.S. Cl. 156—227 **15 Claims**



1. An improved high speed method for producing a plurality of mailing assemblies each such mailing assembly comprised of an envelope and an enclosure consisting of the following steps:

a. providing a plurality of blanks of sheet material with each blank being comprised of an envelope portion having at least two flap sections and an enclosure portion;

b. separating said plurality of blanks one at a time so that formation of each into an envelope with an enclosure can be accomplished rapidly one after the other;

c. folding said enclosure portion of a single blank upon said envelope portion of said blank to form a double thickness of sheet material with said enclosure portion covering substantially all of said envelope portion with the exception of three edges of said envelope portion;

d. applying adhesive on a predetermined area of said envelope portion;

e. separating said enclosure portion from said envelope portion of each blank to form two discrete pieces and retaining said double thickness of material;

f. folding said two flap sections of said envelope portion not covered during the step c. folding step; and

g. folding said double thickness of sheet material so that at least two edges of said envelope portion are sealed to form an envelope assembly having an enclosure.

4,530,732

METHOD OF MAKING EXTRUDABLE THERMOPLASTIC MOLDING MATERIAL FOR MANUFACTURING PLASTIC SHEETING USED IN PROTECTIVE COVERS, ESPECIALLY FOR VEHICLES AND PARTS THEREOF

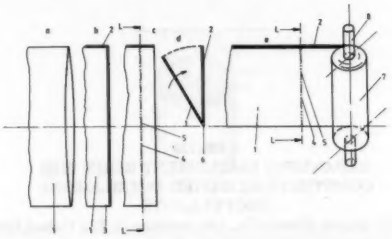
Jörg Horn, Sechsschimmelgasse 8/30, A- 1090 Wien, Fed. Rep. of Germany

Filed Mar. 17, 1983, Ser. No. 476,220

Claims priority, application European Pat. Off., Mar. 20, 1982, 82 102302.5

Int. Cl.³ B29D *7/16*

U.S. Cl. 156—244.18 **4 Claims**



1. A method for producing an extrudable thermoplastic mass to make plastic sheet for the fabrication of protective coverings, particularly for vehicles and vehicle parts, comprising the steps of:

mixing in a constituent mixer at least 45% by weight of linear polyethylene, (LLDPE),

10–50% by weight of high-pressure polyethylene (LDPE),

0.5–10% by weight of low-pressure polyethylene (HDPE),

0.1–5% by weight of olyamides or eurocamides and natural silica, and

up to 5% by weight of fatty-acid esters, dyes, synthetic silicic acid, stabilizers, and processing agents, the sum of the mixed constituents being always 100% by weight, plasticizing said mixture, and extruding the plasticized mixture into a highly elastic, grip-resistant, smooth mass having high puncture resistance and minimum thickness.

4,530,733

APPARATUS FOR IMPREGNATING REINFORCING FIBER MATERIALS WITH A RESINOUS BINDER MATERIAL

Rolf Doellinger, Fischbachau, and Rudolf Schindler, Neubiberg, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Division of Ser. No. 369,641, Apr. 19, 1982, Pat. No. 4,456,495, which is a continuation-in-part of Ser. No. 196,863, Oct. 14, 1980, abandoned. This application Jan. 25, 1984, Ser. No. 559,885

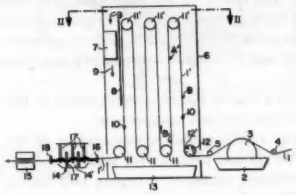
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1979, 2942729

Int. Cl.³ B32B *5/02*

U.S. Cl. 156—441 **6 Claims**

1. An apparatus for producing fiber compound material made of bands of reinforcing fiber material impregnated with a liquid resinous binder, comprising a container (2) for holding said liquid resinous binder, impregnating roller means (3) defining with its upper surface a given level, said impregnating roller means being arranged for rotatably dipping into said container (2) for carrying liquid resinous binder material on the surface of the roller means out of the container, first guide means (4, 5) located upstream and downstream of said impregnating roller means (3) and at a level below said given level for pressing said bands against said upper surface of said impregnating roller means and for guiding a plurality of said bands of

reinforcing fiber material in parallel to one another and into contact with said impregnating roller means so that only one surface of each band contacts said upper surface of the impregnating roller for applying an excess quantity of said liquid resinous binder only to said one surface of the bands, chamber means (6), temperature and air flow control means (7) in said chamber means for circulating heated air through said chamber means (6), calender type roller means (11, 11', 12) arranged in said chamber means for advancing said bands with the liquid resinous binder through said chamber means for completely soaking said bands with said liquid resinous binder, further guide means (16) arranged downstream of said chamber means



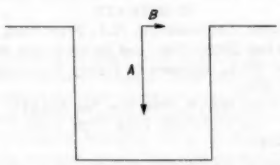
(6) as viewed in the feed advance direction of said soaked bands for guiding said soaked bands out of a substantially horizontal feed advance into a substantially vertical feed advance such that width dimension of the bands is oriented substantially vertically, a fulling station (14) arranged downstream of said further guide means (16) for precisely adjusting the ratio of the quantity of liquid resinous binder material in the bands relative to the quantity of reinforcing fiber material to form fully impregnated bands, and calibrating means (15) arranged downstream of said fulling station for combining a plurality of impregnated bands for achieving a desired cross-section of the fiber compound material.

4,530,734

LOW ENERGY ION ETCHING

Walter F. Klima, 59 Chestnut Hill La. S., Williamsville, N.Y. 14221

Filed Jan. 17, 1983, Ser. No. 458,460
Int. Cl.³ B44C *1/22*; C03C *15/00*
U.S. Cl. 156—628 **6 Claims**



1. A method for producing an etched pattern comprising:
selecting a substrate which is made preferentially etchable by an etchant after irradiation by a neutron flux;
irradiating said substrate with a neutron flux in said pattern;
controlling said neutron flux to a value below that at which either substantial atomic reaction or physical damage is produced; and
etching said substrate in said etchant having a concentration and a temperature and for a time effective to etch said pattern in said substrate.

4,530,735

WET-PROCESS PHOSPHORIC ACID BRIGHTENING REAGENT FOR ALUMINUM

Brooks M. Whitehurst, New Bern; Donald F. Clemens, Greenville; Taylor King, Beaufort, and Garnett B. Whitehurst, New Bern, all of N.C., assignors to Whitehurst Associates, Inc. and Encee Chemical Sales, Inc., both of New Bern, N.C., a part interest

Filed Sep. 28, 1982, Ser. No. 425,573
Int. Cl.³ B44C *1/22*
U.S. Cl. 156—642 **2 Claims**

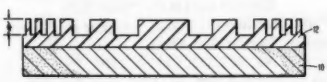
1. A process for brightening aluminum using a wet process acid which consists essentially of
(a) diluting with water a wet process polyphosphoric acid, said wet process polyphosphoric acid comprising a phosphoric acid concentration of about 80% by weight, flouride ions, a phosphorus to flouride ion ratio of about 35:1 and further comprising iron, aluminum and magnesium contaminates so that said phoshoric acid concentration is reduced to about 50% by weight and said phosphorus to flouride ion ratio is increased to about 100:1 and filtering to remove a formed fluoride precipitate;
(b) adding to the diluted polyphosphoric acid mixture copper, nitric acid, and fume inhibitor forming an aluminum brightening bath;
(c) maintaining the total concentration of said iron, aluminum, and magnesium ion contaminants in said bath below about 3% as expressed in aluminum equivalents;
(d) maintaining the purity of said bath to below about 500 ppm organic substances oxidizable in nitric acid;
(e) maintaining said bath's temperature between about 90° C. and about 120° C.; and
(f) immersing the aluminum to be brightened in the bath for about 0.5 to about 4.0 minutes.

4,530,736

METHOD FOR MANUFACTURING FRESNEL PHASE REVERSAL PLATE LENSES

Walter E. Mutter, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 3, 1983, Ser. No. 548,387
Int. Cl.³ H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—643 **18 Claims**



1. Method for making a high quality Fresnel phase plate lens having light transmission of substantially all incident light comprising:
providing a polished lens blank composed of a material suited for the wavelength of light for which it will ultimately be used;
depositing upon the polished side of said lens blank a photosensitive layer capable of having photochemical changes by exposure to light;
exposing said layer with light to form a pattern of said Fresnel phase plate in said layer wherein said photochemical changes are effected depending upon the exposed intensity of light throughout said layer;
developing the exposed said layer to leave a physical Fresnel phase plate in said layer;
anisotropically etching said layer and said lens blank in a suitable reactive ambient where etching of the layer is substantially at the same rate as the lens blank;
continuing said etching until the said phase plate pattern in said layer is replicated in said lens blank and a depth of one-half of the desired

wavelength is reached in said lens blank to form said lens; and

removing any remaining said layer from said Fresnel phase plate lens.

4,530,737

METHOD FOR USE IN RECOMPRESSION EVAPORATION OF A SOLUTION

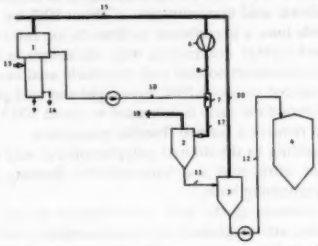
Per H. Östman, Jorvas, Finland, assignor to Ekono Oy, Finland

Filed Sep. 20, 1983, Ser. No. 533,920

Claims priority, application Finland, Sep. 20, 1982, 823230

Int. Cl.³ F26B *3/00*

U.S. Cl. 159—47.1 **3 Claims**



1. A method for concentrating a solution using a recompression evaporation plant comprising at least one evaporation unit, the method comprising:

evaporating liquid from and thus concentrating the solution in the evaporation unit;

mixing the concentrated solution directly with overheated vapour obtained from the recompression evaporation plant, the vapour being sufficiently heated to further vaporize liquid from and thus further concentrate said solution; and

separating the further concentrated solution from the vapours.

4,530,738

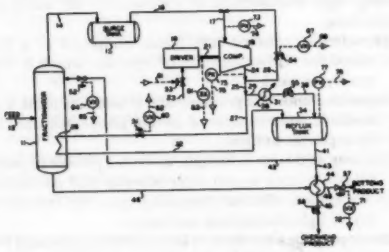
CONSTRAINT CONTROL OF A FRACTIONAL DISTILLATION PROCESS

Gary L. Funk, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 309,333, Oct. 6, 1981, Pat. No. 4,392,877. This application Sep. 30, 1982, Ser. No. 430,625

Int. Cl.³ B01D *3/42*

U.S. Cl. 203—2 **7 Claims**



1. A method for operating and controlling a fractional distillation process, said method comprising the steps of:

providing a feed stream containing components to be separated to a fractional distillation column;

withdrawing an overhead stream from said fractional distillation column and providing said overhead stream to the suction inlet of a compressor;

providing fluid from the discharge outlet of said compressor through a first control valve to a reboiler associated with said fractional distillation column to thereby supply heat to said fractional distillation column;

establishing a first signal representative of the actual position of said first control valve;

establishing a second signal representative of the desired position of said first control valve;

using computing means to compare said first signal and said second signal and establish a third signal which is responsive to the difference between said first signal and said second signal, wherein said third signal is scaled so as to be representative of the speed of said compressor required to maintain said first signal substantially equal to said second signal;

establishing a fourth signal representative of the actual suction pressure for said compressor;

establishing a fifth signal representative of the maximum allowable suction pressure for said compressor;

using computing means to compare said fourth signal and said fifth signal and establish a sixth signal which is responsive to the difference between said fourth signal and said fifth signal, wherein said sixth signal is scaled so as to be representative of the speed of said compressor required to maintain the magnitude of said fourth signal substantially equal to the magnitude of fifth signal;

establishing a seventh signal representative of the actual discharge pressure for said compressor;

establishing an eighth signal representative of the minimum allowable discharge pressure for said compressor;

using computing means to compare said seventh signal and said eighth signal and establish a ninth signal which is responsive to the difference between said seventh signal and said eighth signal, wherein said ninth signal is scaled so as to be representative of the speed of said compressor required to maintain the magnitude of said seventh signal substantially equal to the magnitude of said eighth signal;

using high select means to establish a tenth signal representative of the highest compressor speed represented by said third, sixth and ninth signals; and

controlling the speed of said compressor in response to said tenth signal.

4,530,739

METHOD OF FABRICATING AN ELECTROPLATED SUBSTRATE

Joseph J. Hanak, Lawrenceville, N.J.; Prem Nath, Rochester; Masatsugu Izu, Birmingham, and James Young, West Bloomfield, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Mar. 9, 1984, Ser. No. 588,013

Int. Cl.³ C25D *1/04, 1/20, 5/48*

U.S. Cl. 204—4 **31 Claims**

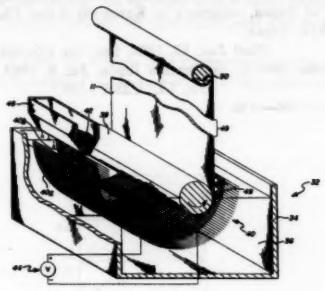
1. A method of fabricating a textured, back reflective, substantially defect-free substrate, said substrate adapted for the subsequent deposition thereonto of thin film photoresponsive material; said method including the steps of:

providing a mandril;

texturing the mandril so as to provide a substantially defect-free outer surface, said surface characterized by features which (1) provide for the diffuse reflection of light and (2) do not substantially interfere with the subsequent deposition of uniform and homogeneous thin film photoresponsive material thereupon;

electroplating a metallic material onto the textured, substantially defect-free mandril surface; and

removing the metallic material from the mandril surface, whereby the textured, substantially defect-free outer surface of the mandril is replicated by the electroplated metallic material.



4,530,740

METHOD OF PRODUCING CLOSED CANALS IN COMPONENTS SUCH AS HEAT EXCHANGERS AND ROCKET COMBUSTION CHAMBER WALLS

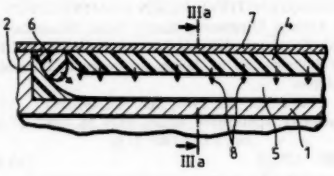
Dietmar Wolf, Siegertsbrunn, and Otto Tuscher, Oberschleisheim, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Fed. Rep. of Germany

Filed Apr. 27, 1984, Ser. No. 604,838

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1983, 3315407

Int. Cl.³ C25D *1/02*

U.S. Cl. 204—9 **6 Claims**



1. A method of closing a canal in a wall of a chamber, comprising inserting an enlongated filler into the canal leaving at least one end of the filler which projects out of the canal, filling a remaining space of the canal with an electrically conducting meltable substance, engaging the projecting end of the filler, pulling the engaged projecting end of the filler out of the substance in the canal leaving an expansion chamber with a hole therein extending to a surface of the substance in the canal, the filler being pulled out of the substance when the substance is at a temperature which is above room temperature so that the substance becomes slightly plastic, plugging the hole to form a continuous surface for the substance in the canal, electroplating metal plastic material to the component to form a cover over the canal and over the continuous surface of the substance in the canal, whereby heat produced during the electroplating causes expansion of the substance into the expansion chamber, and subsequently melting the meltable substance out of the canal.

4,530,741

AQUEOUS ACID PLATING BATH AND BRIGHTENER COMPOSITION FOR PRODUCING BRIGHT ELECTRODEPOSITS OF TIN

William E. Rosenberg, Strongsville, Ohio, assignor to Columbia Chemical Corporation, Macedonia, Ohio

Filed Jul. 12, 1984, Ser. No. 630,363

Int. Cl.³ C25D *3/32*

U.S. Cl. 204—54 R **13 Claims**

1. A tin plating brightening composition comprising;

from about 0.5 to about 25 percent by weight of a primary tin brightener, said primary tin brightener being a disubstituted naphthalene having at least one substituted aldehyde group thereon, with said remaining group other than an aldehyde group being selected from the group consisting of methyl, hydyroxy methyl, and carboxyl; and,

from about 1 to about 97 percent by weight of a compound selected from the group consisting of acrylic acid, methacrylic acid, or their bath soluble salt, and combinations thereof.

7. An aqueous acid electroplating bath containing stannous ions and sulfuric acid for producing electrodeposits of tin, comprising:

from about 0.005 to about 0.5 grams per liter of bath solution of a primary brightener, said primary brightener being a disubstituted naphthalene having at least one substituted aldehyde group thereon, with said remaining group other than said aldehyde group being selected from the group consisting of methyl, hydroxy methyl, and carboxyl.

4,530,742

ELECTRODE AND METHOD OF PREPARING SAME

William W. Carlin, Akron, and Debra S. Marzec, Uniontown, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 461,096, Jan. 26, 1983, abandoned. This application Oct. 19, 1983, Ser. No. 543,577

Int. Cl.³ C25B *1/26*

U.S. Cl. 204—95 **34 Claims**

19. In a method of electrolyzing alkali metal chloride brine comprising passing electrical current from an anode to a cathode in a common electrolyte, evolving anodic and cathodic products and forming chlorate ion, the improvement wherein said cathode comprises:

(a) a titanium substrate; and

(b) a coating thereon, substantially free of deposited titanium, comprising:

(1) a first oxide layer, deposited on said substrate and comprising a major portion of ruthenium and a minor portion of tin; and

(2) a second oxide layer, atop said first oxide layer, comprising a major portion of ruthenium and minor portions of tin and palladium.

4,530,743

ELECTROLYSIS CELL

Oronzio deNora, Milan, Italy, assignor to Oronzio deNora Impianti Elettrochimici S.p.A., Milan, Italy

Division of Ser. No. 382,690, May 27, 1982, Pat. No. 4,444,632, which is a division of Ser. No. 151,346, May 19, 1980, Pat. No. 4,340,452, which is a continuation-in-part of Ser. No. 102,629, Dec. 11, 1979, Pat. No. 4,343,690. This application Oct. 6, 1983, Ser. No. 539,522

Claims priority, application Italy, Aug. 3, 1979, 24919 A/79; Jun. 28, 1980, 19592 A/80

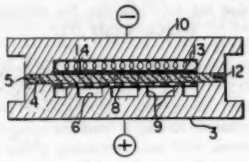
The portion of the term of this patent subsequent to Jul. 20, 1999, has been disclaimed.

Int. Cl.³ C25B *1/34*

U.S. Cl. 204—98 **14 Claims**

1. A method of generating halogen comprising electrolyzing an aqueous halide solution in the anolyte chamber of a cell provided with a diaphragm capable of cation exchange divid-

ing the cell into anolyte and catholyte compartments with anodic and cathodic elements contacting opposite sides of the diaphragm, said cathodic element comprising an electroconductive sheet or layer extending along the diaphragm and



being open to electrolyte movement and gas evolved along the diaphragm and a thin layer having a finer porosity than said cathodic layer between said cathodic layer and the diaphragm and flowing an aqueous medium through the cathodic layer and along the diaphragm.

4,530,744

METHOD AND APPARATUS FOR THE PRODUCING OF LIQUID HYDROGEN

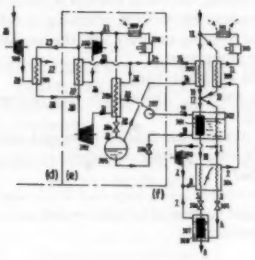
Eric M. Smith, 26 Eastcliffe Ave., Kenton Park, Newcastle-upon-Tyne, NE3 4SN, England

Filed Mar. 9, 1984, Ser. No. 588,110

Claims priority, application United Kingdom, Mar. 10, 1983, 8306590; May 16, 1983, 8313436

Int. Cl.³ C25B *1/04, 9/00*

U.S. Cl. 204—129 **17 Claims**



1. A method of producing liquid hydrogen comprising electrolysing water under pressure to generate separate streams of oxygen and hydrogen gas under pressure, removing heat from the hydrogen stream during liquefaction thereof by heat exchange with an inert medium flowing in a separate closed cycle buffer cooling circuit, and expanding the oxygen stream in an expansion means to produce cooling for the inert medium buffer cooling circuit, passing an inert medium liquefaction stream through wet expansion means to liquefy some of the inert medium, cooling the hydrogen product stream in a first heat exchange stage against the gaseous output of the wet expansion means and in a second heat exchange stage against the liquefied inert medium and cooling at least a part of the inert medium liquefaction stream flowing to the wet expansion means against a return flow of inert medium from the second heat exchange stage.

4,530,745

METHOD FOR ELECTROLYZING CEROUS SULFATE

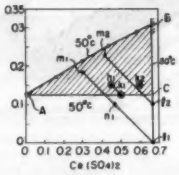
Tatsuyoshi Komatsu, Kamakura; Shigeaki Numata; Katsuhiko Hioki, both of Yokohama, and Toshihiko Sumino, Kawasaki, all of Japan, assignors to Kawasaki Kasei Chemicals Ltd., Tokyo, Japan

Filed Jun. 13, 1984, Ser. No. 620,095

Claims priority, application Japan, Jul. 5, 1983, 58-121790

Int. Cl.³ C25B *1/00*

U.S. Cl. 204—130 **4 Claims**



1. A method for electrolyzing cerous sulfate in the electrolytic oxidation of cerous sulfate to ceric sulfate in an aqueous sulfuric acid solution, characterized in that the concentration of the cerous sulfate in the electrolyte to be supplied to the electrolytic cell is maintained, by the presence of ceric sulfate, at a level of at least the saturated concentration of cerous sulfate in the aqueous sulfuric acid solution (exclusive of the cerous sulfate and ceric sulfate) at the initial sulfuric acid concentration and at the temperature of electrolysis, and at most the saturated concentration of cerous sulfate in the presence of the ceric sulfate in the aqueous sulfuric acid solution at the initial sulfuric acid concentration and at the temperature of electrolysis, and the concentration of the ceric sulfate in the electrolyte is maintained at a level of at most the saturated concentration of ceric sulfate in the aqueous sulfuric acid solution at the initial sulfuric acid concentration and at the temperature of electrolysis.

4,530,746

PHOTOSENSITIVE RESIN COMPOSITION

Kazufumi Azuma, Hiratsuka; Kazuo Nate, Machida; Mitsuo Nakatani, Yokohama; Hitoshi Yokono, Fujisawa, and Takeshi Endo, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 20, 1983, Ser. No. 496,591

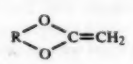
Claims priority, application Japan, May 24, 1982, 57-86606

Int. Cl.³ C08F *2/50*

U.S. Cl. 204—159.13 **15 Claims**

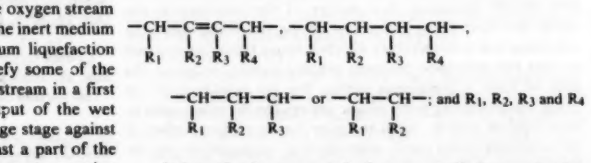
1. A photosensitive resin composition comprising:

(a) 10 to 90 parts by weight of at least one polymerizable monomer represented by the formula:



(1)

wherein R represents



independently represent hydrogen, an alkyl group having 1–5 carbon atoms, a phenyl group or a substituted phenyl group,

(b) 90 to 10 parts by weight of at least one compound selected from the group consisting of epoxy-acrylate resins, 1,2-polybutadiene resins, polyester resins and organopolysiloxanes, all having one or more acryloyloxy groups or methacryloyoxy groups on their molecular end or ends; and

(c) 0.05 to 5 parts by weight of a photosensitizer based on 100 parts by weight of the sum of the components (a) and (b).

4,530,747

PHOTOPOLYMERIZABLE MIXTURE AND PHOTOPOLYMERIZABLE COPYING MATERIAL PREPARED THEREWITH

Reinhard Dönges, Bad Soden, and Klaus Horn, Hofheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 14, 1983, Ser. No. 504,180

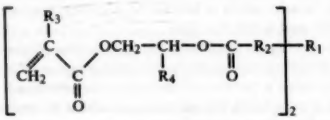
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1982, 3223105; Jul. 27, 1982, 3227913

Int. Cl.³ C08J *3/28;* **C08L** *33/02, 33/04, 69/00*

U.S. Cl. 204—159.16 **7 Claims**

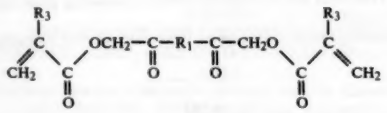
1. A mixture is polymerizable by radiation, comprising:

(a) a polymerizable compound having terminal acrylic or methacrylic acid ester groups, selected from a compound of one of the general formulas



(I)

and



(II)

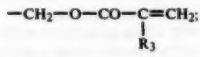
wherein

R_1 is a phenylene group or a biphenyldiyl group or a group formed by two phenylene groups which are linked by a bridge comprising an oxygen atom, a sulphur atom, a sulfone group, a substituted or unsubstituted alkylene group or cycloalkylene group, or a group of the formula —(O—alkylene)$_n$O— with n=1–3,

R_2 is an oxygen atom or the group CH_2—CH_2—CO;

R_3 is a hydrogen atom or a methyl radical; and

R_4 is a hydrogen atom or the radical



(b) an aqueous soluble organic polymeric binder; and

(c) a polymerization initiator which can be activated by radiation.

4,530,748

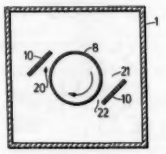
CELL CONFIGURATION FOR APPARATUS FOR ELECTROLYTIC RECOVERY OF SILVER FROM SPENT PHOTOGRAPHIC PROCESSING SOLUTIONS

Stanley M. Zuwala, Cambridge, and Lloyd D. Cass, Toronto, both of Canada, assignors to New Horizons Manufacturing Ltd., Ontario, Canada

Filed May 17, 1984, Ser. No. 611,112

Int. Cl.³ C25C *7/00*

U.S. Cl. 204—273 **16 Claims**



1. Apparatus for the electrolytic recovery of silver from spent photographic processing solutions, comprising:

a tank for containing spent photographic processing solution from which silver is to be recovered;

at least one cylindrical cathode, each said cathode carried for rotation in said tank about a vertical axis;

for each said cathode, at least one vertically disposed slat-like anode carried in alignment close to said cathode, each said anode being positioned with respect to the surface of said cathode so as to define a vertically elongated venturi between said cathode and said anode, the narrowest section of each said venturi being substantially along a vertical edge of each said anode;

means for rotatably supporting said cathode in said tank;

means for supporting each said anode in said position with respect to said cathode;

a motor connected to rotate said cathode at a rate sufficient to induce turbulence in the solution in the region of each said venturi; and

means for supplying power to each said rotating cathode and each said anode.

4,530,749

BONDED ASBESTOS DIAPHRAGMS

Richard N. Beaver, Angleton, Tex.; Kenneth R. Evans, Russellville, Ark., and Donald D. Waters, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 5, 1981, Ser. No. 270,769

Int. Cl.³ C25B *13/02*

U.S. Cl. 204—296 **6 Claims**

1. A hydraulically-permeable diaphragm material of improved hydrophilicity for use in brine electrolysis cells, said material comprising a matte of fluoropolymer-bonded asbestos fibers having dispersed therein in an amount in the range of about 5% to about to about 20% by weight of the total diaphragm weight.

4,530,750

APPARATUS FOR COATING OPTICAL FIBERS

Sol Aisenberg, Natick, and Martin L. Stein, Bedford, both of Mass., assignors to A. S. Laboratories, Inc., Waltham, Mass.

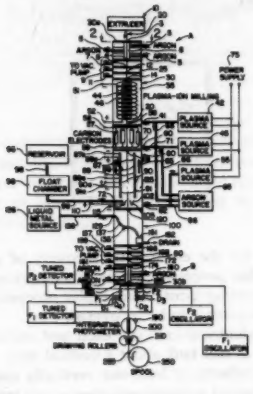
Continuation of Ser. No. 501,144, Jun. 13, 1983, abandoned, which is a division of Ser. No. 245,937, Mar. 20, 1981, Pat. No. 4,402,993. This application Sep. 10, 1984, Ser. No. 649,157

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—298 **4 Claims**

1. An apparatus for continuously producing a vitreous optical fiber heremetically sealed in a continuous sheath of elemental material which apparatus comprises: a chamber having an ingress end and an egress end; means for moving said fiber

axially through said chamber; means within said chamber at both of said ends for maintaining axial and central alignment of said fiber within said chamber without physical engagement of the fiber by the alignment means; means for creating a vacuum in said chamber; said chamber having first and second vacuum zones sequentially from said ingress toward said egress end and in open communication with one another; means in said first vacuum zone for propelling and directing a plasma of high



energy ions against said surface of said fiber in said first vacuum zone whereby said plasma impinges on said surface to move surface imperfections and loose atoms therefrom; positive and negative electrodes of inorganic elemental material in said second vacuum zone and spaced around said fiber; and, means employing a plasma of ions in said second vacuum zone to cause said electrodes to sputter and deposit a first inorganic elemental film of said material on said moving fiber in said second vacuum zone.

4,530,751

ELECTROCHEMICAL CELL AND METHOD OF PRODUCING THE SAME

Fujio Ishiguro, Nagoya, Japan, assignor to NGK Insulators, Ltd., Japan

Filed Jul. 30, 1984, Ser. No. 635,913
Claims priority, application Japan, Aug. 9, 1983, 58-144478
Int. Cl.³ G01N *27/58*
U.S. Cl. 204—424 **4 Claims**

1. An electrochemical cell, comprising an oxygen-ion-conductive solid electrolyte body, and at least one electrode formed of a layer of sintered mixture consisting of a platinum group metal and an oxygen-ion-conductive solid electrolyte, said electrode being bonded to said solid electrolyte body and having an oxygen-ion-conductive solid electrolyte stuffed into interstices of said sintered mixture of the electrode, said solid electrolyte in said interstices being heat treated at a temperature lower than sintering temperature of said sintered mixture.

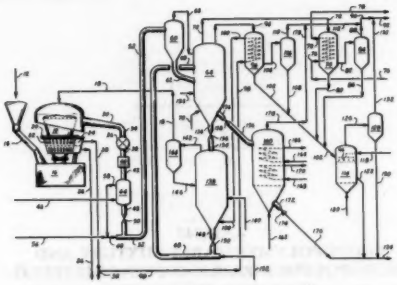
3. A method of producing an electrochemical cell, comprising steps of forming a layer of sintered mixture on a surface of an oxygen-ion-conductive solid electrolyte body, said mixture consisting of a platinum group metal and an oxygen-ion-conductive solid electrolyte, impregnating interstices of said layer of sintered mixture with a liquid selected from the group consisting of a suspension of fine powder particles of an oxygen-ion-conductive solid electrolyte and a solution of metallic compound capable of generating an oxygen-ion-conductive solid electrolyte upon heating, and heating the thus impregnated layer formed on said solid electrolyte body at a temperature below sintering temperature of said layer of sintered mixture.

4,530,752

OIL SHALE RETORTING PROCESS

Roland F. Deering, Brea; Hugh W. Gowdy, Irvine, and Arnold E. Kelley, Orange, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Jun. 20, 1984, Ser. No. 622,638
Int. Cl.³ C10G *1/00*; C10B *53/06*
U.S. Cl. 208—11 R **17 Claims**



1. A process for retorting oil shale solids which comprises:

(a) contacting said oil shale solids with a hot, non-oxidizing recycle gas comprising gases and vapors from step (e) under pyrolysis conditions in a first retorting zone in the substantial absence of the hot decarbonized solids formed in step (c) to produce an effluent containing pyrolysis products and pyrolyzed oil shale solids;

(b) recovering liquid and gaseous hydrocarbons from the effluent of said first retorting zone;

(c) contacting said pyrolyzed oil shale solids with a gas containing molecular oxygen in a combustion zone under conditions such that at least a portion of the organic material remaining in said solids is burned to produce hot, decarbonized solids and a hot flue gas;

(d) contacting at least a portion of the gases in the effluent from said first retorting zone in the substantial absence of molecular oxygen with a portion of said hot, decarbonized solids produced in step (c) in the presence of added hydrocarbon-containing fines in a second retorting zone such that said gases are heated and said fines are pyrolyzed to produce pyrolyzed fines and pyrolysis products containing gases and vapors; and

(e) recovering gases and vapors from said second retorting zone.

4,530,753

METHOD OF CONVERTING HEAVY HYDROCARBON OILS INTO LIGHT HYDROCARBON OILS

Yoshimi Shiroto, Yokohama; Shinichi Nakata, Kawasaki, and Hideki Hashimoto, Tokyo, all of Japan, assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 571,137, Jan. 16, 1984, abandoned, which is a continuation of Ser. No. 338,152, Jan. 8, 1982, abandoned. This application Jul. 16, 1984, Ser. No. 631,503
Claims priority, application Japan, Jan. 25, 1981, 56-9297
Int. Cl.³ C10G *65/12, 69/06*
U.S. Cl. 208—68 **8 Claims**

1. A process for the conversion of a heavy hydrocarbon oil into light hydrocarbon oils, comprising

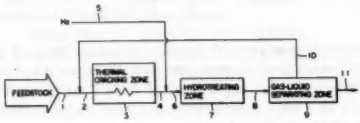
thermally cracking a heavy hydrocarbon oil containing at least 10 vol % of fractions having a boiling point of at least 900° F. to convert at least about 15 vol % of said fractions having a boiling point of at least 900° F. into light hydrocarbon oils having a boiling point of below 900° F., said thermal cracking being carried out at a temperature of

400° to 530° C. and a pressure of 0 to 200 Kg/cm^{2}G with a residence time of 1 min. to 5 hours, the product of the thermal cracking containing toluene insolubles, and

hydrotreating the toluene insolubles-containing product of the thermal cracking as such at a temperature of 350°–450° C., a hydrogen pressure of 50 to 250 Kg/cm^{2}G, a liquid space velocity of 0.1 to 5 Hrs^{-1} and a hydrogen to oil feed rate of 100 to 2000 Nl/l add in the pressure of a catalyst which comprises:

a porous-carrier comprising a clay mineral consisting essentially of magnesium silicate having a double-chain structure, and

one or more catalytic metal components composited with said carrier, the metal of said catalytic metal components being selected from the group consisting of the metals belonging to Groups VB, VIB, VIII and IB of the Periodic Table, said catalytic metal components being present in an amount of between about 0.1% and about 30% in



terms of metal oxide based on the total weight of said catalyst, said catalyst further having the following characteristics (1)–(4):

(1) an average pore diameter being between about 200 and about 400 Å,

(2) a total volume of pores with a pore diameter of 75 Å or more being between about 0.5 and about 1.5 cc/g, the volume of pores with a diameter of not greater than 100 Å being not more than 0.1 cc/g, the volume of pores with a diameter of between about 200 and about 400 Å being at least about 0.2 cc/g, the volume of pores with a diameter of at least 1500 Å being not greater than about 0.03 cc/g,

(3) a total surface area of pores with a pore diameter of 75 Å or more being at least about 70 m^2/g,

(4) an average catalyst diameter being between about 0.6 and about 5 mm,

whereby a hydrotreated product having a toluene insolubles content of no more than 0.5 wt % is obtained.

4,530,754

PROCESS FOR THE CONVERSION OF HEAVY HYDROCARBON OILS INTO LIGHT HYDROCARBON OILS

Yoshimi Shiroto, Yokohama; Shinichi Nakata, Kawasaki, and Hideki Hashimoto, Tokyo, all of Japan, assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 571,136, Jan. 16, 1984, abandoned, which is a continuation of Ser. No. 338,110, Jan. 8, 1982, abandoned. This application Jul. 16, 1984, Ser. No. 631,504
Claims priority, application Japan, Jan. 25, 1981, 56-9297
Int. Cl.^{3} C10G *65/12, 69/06*
U.S. Cl. 208—68 **8 Claims**

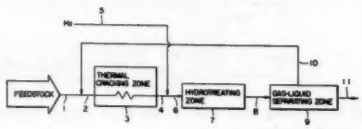
1. A process for the conversion of a heavy hydrocarbon oil into light hydrocarbon oils, comprising

thermally cracking a heavy hydrocarbon oil containing at least 10 vol % of fractions having a boiling point of at least 900° F. to convert at least about 15 vol % of said fractions having a boiling point of at least 900° F. into light hydrocarbon oils having a boiling point of below 900° F., said thermal cracking being carried out at a temperature of 400° to 530° C. and a pressure of 0 to 200 Kg/cm^{2}G with a residence time of 1 min. to 5 hours, the product of the thermal cracking containing toluene insolubles, and

hydrotreating the toluene insolubles-containing product of the thermal cracking as such at a temperature of 350° to 450° C., a hydrogen pressure of 50 to 250 Kg/cm^{2}G, a liquid space velocity of 0.1 to 5 Hrs^{-1} and a hydrogen to oil feed rate of 100 to 2000 Nl/l and in the presence of a catalyst which comprises:

a porous carrier consisting essentially of one or more inorganic oxides of at least one member selected from the group consisting of the elements belonging to Groups II, III and IV of the Periodic Table, and

one or more catalytic metal components composited with said carrier, the metal of said catalytic metal components being selected from the group consisting of the metals belonging to Groups VB, VIB, VIII and IB of the Periodic Table, said catalytic metal components being present in an amount of between about 0.1% and about 30% in terms of metal oxide based on the total weight of said



catalyst, said catalyst having the following characteristics (a)–(d):

(a) an average pore diameter being between about 200 and about 400 A,

(b) a total volume of pores with a pore diameter of 75 A or more being between about 0.5 and about 1.5 cc/g, the volume of pores with a diameter of not greater than 100 A being not more than 0.1 cc/g, the volume of pores with a diameter of between about 200 and about 400 A being at least about 0.2 cc/g, the volume of pores with a diameter of at least 1500 A being not greater than about 0.03 cc/g,

(c) a total surface area of pores with a pore diameter of 75 A or more being at least about 70 m^2/g,

(d) an average catalyst diameter being between about 0.6 and about 5 mm,

whereby a hydrotreated product having a toluene insolubles content of no more than 0.5 wt % is obtained.

4,530,755

COKING WITH SOLVENT SEPARATION OF RECYCLE OIL USING COKER NAPHTHA

Joseph M. Ritchie, Morristown; Bong H. Chang, Summit, and John Sosnowski, Westfield, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Oct. 31, 1983, Ser. No. 547,086
Int. Cl.^{3} C10G *21/06, 55/04*
U.S. Cl. 208—96 **13 Claims**

1. A coking process comprising the steps of:

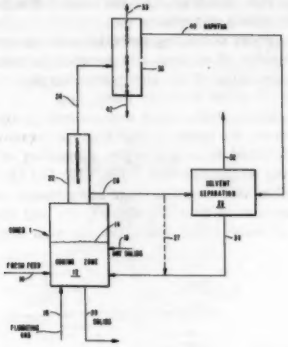
(a) coking a carbonaceous chargestock in a coking stock at coking conditions to produce coke and a vapor phase product, including heavy and light normally liquid hydrocarbons;

(b) separating at least a portion of said heavy hydrocarbons from said vapor phase product, said separated hydrocarbons having a Conradson carbon content ranging from about 5 to about 50 weight percent;

(c) subsequently contacting at least a portion of said separated heavy hydrocarbons with coker naphtha in a solvent separation zone at solvent separation conditions, including a volumetric ratio of said solvent to said portion of separated heavy hydrocarbon ranging from about 0.5:1 to 10:1, to separate said heavy hydrocarbons into a high Conradson carbon hydrocarbonaceous product comprising a minor portion of said coker naphtha and a low Conradson carbon hydrocarbonaceous product comprising a major portion of said coker naphtha;

(d) recycling at least a portion of said high Conradson car-

bon hydrocarbonaceous product comprising said minor portion of coker naphtha to said coking zone; and



(e) recovering said low Conradson carbn hydrocarbonaceous product of step (c).

4,530,756

CATALYSIS OVER ACTIVATED HIGH SILICA ZEOLITES

Clarence D. Chang, Princeton, and Joseph N. Miale, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 333,370, Dec. 22, 1981, Pat. No. 4,444,902. This application Feb. 17, 1984, Ser. No. 581,497

Int. Cl.³ C10G *11/05, 47/16*

U.S. Cl. 208—111 **22 Claims**

1. A process for converting a feedstock comprising hydrocarbon compounds to conversion products comprising hydrocarbon compounds of lower molecular weight than feedstock hydrocarbon compounds which comprises contacting said feedstock at conversion conditions, including a temperature of from about 100° C. to about 800° C., a pressure of from about 0.1 atmospheres to about 200 atmospheres, a weight hourly space velocity of from about 0.08 hr^{-1} to about 2000 hr^{-1} and a hydrogen/feedstock hydrocarbon compound mole ratio of from 0 to about 100, with a catalyst composition comprising a crystalline zeolite having an initial silica:alumina mole ratio greater than about 100:1 prepared by a method which comprises calcining the zeolite at a temperature of from about 200° C. to about 600° C. for a period of time ranging from about 1 minute to about 48 hours, contacting said calcined zeolite with from about 0.1 to about 1 gram of solid aluminum fluoride per gram of zeolite at a temperature of from about 0° C. to about 65° C., and converting said aluminum fluoride contacted zeolite to hydrogen form.

4,530,757

PROCESS FOR UPGRADING HEAVY CRUDE OILS

Lillian A. Rankel, Princeton, and Paul Shu, Princeton Junction, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 29, 1984, Ser. No. 594,582

Int. Cl.³ C10G *25/00, 25/05*

U.S. Cl. 208—251 R **6 Claims**

1. A method for upgrading heavy crude oil which comprises oxidizing said crude oil in a first stage to produce an oxidized oil containing from about 0.5 to 3.0 wt. % oxygen, introducing said oxidized oil to a second stage coking zone wherein the oil is subjected to mild coking at a temperature of about 750° to 900° F. under a pressure of about 250 to 500 psig and a liquid hourly space velocity (LHSV) of about 3 to 5 $hours^{-1}$; introducing the coked oil to a third stage settling zone for a period of time of 0.1 to about 3 hours, and thereafter recovering an upper phase product of reduced metal content.

4,530,758

ORE FLOTATION METHOD

Rory L. Tibbals, and Kim N. Unger, both of Tucson, Ariz., assignors to Thiotech, Inc., Tucson, Ariz.

Continuation of Ser. No. 379,164, May 17, 1982, abandoned. This application Feb. 13, 1984, Ser. No. 578,990

Int. Cl.³ B03D *1/14*

U.S. Cl. 209—166 **7 Claims**

1. The method of recovering copper from a copper-bearing ore which comprises froth flotation of the ore in alkaline circuit and in alkaline circuit in the presence of a phosphorodithio compound of the formula:

$$X-S-\overset{\overset{S}{\|}}{P}(OR)_2$$

wherein X is selected from the class consisting of hydrogen, alkali metal and ammonium and R is an alkyl-substituted phenyl radical having a total of from 8 to 14 carbon atoms, from 1 to 3 alkyl substituents, and from 2 to 6 carbon atoms in each alkyl substituent.

4,530,759

HEMODIALYSIS APPARATUS WITH DEGASSING MEANS FOR THE DIALYSIS SOLUTION

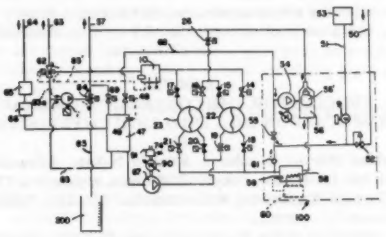
Wilfried Schäl, Bad Homburg von der Hohe, Fed. Rep. of Germany, assignor to Fresenius Aktiengesellschaft, Bad Homburg von der Hohe, Fed. Rep. of Germany

Continuation of Ser. No. 406,711, Aug. 9, 1982, abandoned, which is a continuation of Ser. No. 198,912, Oct. 20, 1980, abandoned, which is a continuation of Ser. No. 69,387, Aug. 24, 1979, Pat. No. 4,267,040. This application May 21, 1984, Ser. No. 613,005

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1978, 2838414

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—104 **12 Claims**



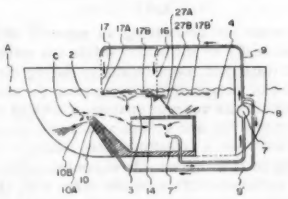
1. In a hemodialysis apparatus, wherein fresh dialysis solution is supplied to a dialyzer (**4**) by fresh dialysis solution supply means (**50, 51, 52, 53**) and spent dialysis solution is removed from the dialyzer (**4**) by a withdrawal device (**67**), the improvement comprising reduced pressure closed loop circuit balancing means (**22, 23**) for balancing a batch of fresh dialysis solution against an equal batch of spent dialysis solution, valve and conduit means operatively connecting said supply means to said balancing means and said withdrawal device to said dialyzer and to said balancing means for supplying batches of fresh dialysis solution through the balancing means to the dialyzer while discharging corresponding batches of spent dialysis solution from the dialyzer through the balancing means, first degassing means (**100**) operatively interposed between said supply means and said balancing means for degas-

sing said fresh dialysis solution, second degassing means (47) operatively interposed between said dialyzer and said balancing means for degassing spent dialysis solution supplied to said balancing means so that only batches of degassed fresh dialysis solution and of degassed spent dialysis solution are balanced relative to each other, further conduit means (68) operatively interconnecting said first (100) and second (47) degassing means, and suction pump means (54) operatively connected in said further conduit means (68) for causing a further reduced pressure in said further conduit means (68), said further reduced pressure being larger than said first mentioned reduced pressure for drawing air separated from said spent dialysis solution in said second degassing means (47) through said further conduit means (68).

4,530,760
WATER SURFACE FLOTAGE SUCTIONING APPARATUS

Masuo Shimura, 47, Ohashi-machi 2-chome, Minami-ku, Yokohama-shi, Kanagawa-ken, Japan

Filed Dec. 17, 1982, Ser. No. 452,976
Claims priority, application Japan, Jan. 11, 1982, 57-2570
Int. Cl.³ B01D *12/00*; **E02B** *15/00*
U.S. Cl. 210—242.3 **22 Claims**



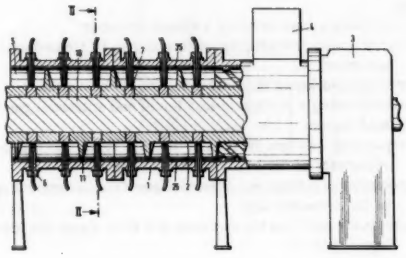
7. Water flotage collecting apparatus comprising means defining water guide passage having first and second ends, means defining a water guide inlet port at the first end and a collection tank at the second end, a water guide plate mounted movably in the water guide passage, support means for supporting the water guide plate at a predetermined depth in water in the water guide passage and flow means for controlling water flow over the guide plate, the plate further comprising water current ejection means mounted beneath the guide and having openings for ejecting water downward and forward from the water ejection means.

4,530,761
EXTRUSION DEVICES

Klaus Koch, Laatzen; Rainer Klaus, Hanover; Gerhard Syrbiüs, Grossburgwedel, and Hans Joachim Schaeffer, Laatzen, all of Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Mar. 20, 1984, Ser. No. 591,570
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1983, 3310485
Int. Cl.³ B01D *29/00*
U.S. Cl. 210—407 **8 Claims**

1. In an extrusion device for separating liquids from liquid-solid mixtures, comprising a hollow barrel, said barrel having first and second opposed end regions and an internal surface, feed means for said liquid-solid mixture located in said first end region, discharge outlet means for material having had liquid extracted therefrom in said second end region, a screw rotatable in said hollow interior of said barrel, said screw including a core portion, at least one flight helically disposed around said core of said screw, said at least one flight being discontinuous, pin members projecting radially inwardly into said hollow interior of said barrel intermediate said end regions, said discontinuous portions of said at least one flight on said screw being so dimensioned as to permit said screw to rotate past said pins, each of said pins including an inner tip portion located adjacent said core of said screw, said pins and said core of said screw jointly defining separation gaps, said gaps in use, being substantially self-cleaning, each said retaining pin defining an internal axial discharge bore for removing liquid extracted from said mixture from said barrel and a drainage or discharge system in fluid flow communication with said discharge bores, the improvements comprising lining means disposed adjacent said internal surface of said barrel, said lining means comprising a plurality of segments, said segments being disposed relative to one another in the form of a wall; an end face portion detachably affixed to said tip portion of each said pin, each said

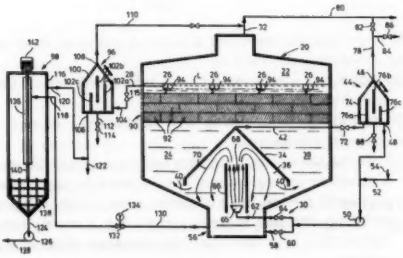


end face portion defining an axial bore, said axial bore in said end face portion being aligned with said axial bore in said pin; and said screw comprises a mandrel, a plurality of screw flight portions mounted on said mandrel, said screw flight portions being axially spaced apart, and at least one ring member, said ring member being spring-mounted on said mandrel and being disposed between adjacent ones of said flight portions, said ring portions defining said core of said screw and forming said discontinuous portions of said flight, said separation gaps being defined between said end face portions mounted on said pins and said ring portions mounted on said mandrel.

4,530,762
ANAEROBIC REACTOR

Leonard S. Love, 578 Minette Cir., Mississauga, Ontario, Canada L5A 3B9

Filed Mar. 28, 1984, Ser. No. 594,180
Int. Cl.³ C02F *3/28*
U.S. Cl. 210—603 **16 Claims**



1. An anaerobic reactor comprising:
a tank defining a closed chamber for receiving a body of liquid;
liquid inlet means disposed in a lower region of the tank and through which wastewater to be treated can be introduced into the tank;
treated water outlet means in an upper region of the tank;
a gas outlet above the liquid level in the tank;
a reaction hood disposed in said tank above the liquid inlet means and defining a mixing zone below the hood and a

relatively quiescent zone outside the hood into which liquid can escape around marginal portions of the hood, the inlet means being adapted to cause wastewater entering the tank from the inlet means to promote mixing of liquid in said mixing zone;

an outlet within the hood through which mixed liquid and entrained gas can be withdrawn;

a gas separator having an inlet coupled to said hood outlet and respective outlets for separated gas and liquid; and,

means adapted to recycle separated liquid from the gas separator to said tank liquid inlet means.

15. A method of anaerobic treatment of wastewater comprising:

providing a tank defining a closed chamber;

continuously introducing wastewater to be treated into said chamber;

mixing said liquid in a lower region of the chamber;

withdrawing a portion of said liquid and entrained gas from said region;

separating the gas from said portion while returning the remainder of the liquid to the chamber;

continuously removing treated water from an upper region of the chamber; and,

removing gas from the chamber at a level above the level of liquid therein.

4,530,763

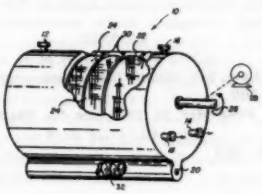
METHOD FOR TREATING WASTE FLUID WITH BACTERIA

Robert A. Clyde, P.O. Box 983, Asheville, N.C. 28802, and Andrew Whipple, P.O. Box 276, Montreat, N.C. 28757

Filed Jul. 11, 1983, Ser. No. 512,534

Int. Cl.³ C02F *3/04;* **C12N** *11/08;* **D06M** *16/00;* **C12R** *1/38*

U.S. Cl. 210—610 **14 Claims**



1. A process for removing a selected chemical from waste fluid comprising the steps of:

(a) incubating a selected bacteria which will attach the selected chemical;

(b) sterilizing, innoculating and incubating a nutrient medium for the bacteria;

(c) placing the nutrient medium and the selected bacteria in a container having a plurality of porous support members supported therein, each of said support members having a webbing attached thereto comprising a multiplicity of high surface area fibers having a diameter of about ½ inch or less;

(d) moving the support members and the nutrient medium relative to each other for a time period sufficient to produce satisfactory bacterial cell growth and to attach the bacterial cells to the webbing;

(e) removing the nutrient medium from the container;

(f) introducing the waste fluid into the container and removing the waste fluid and the support members relative to each other for a time period sufficient to attach the chemical to the bacterial cells; and

(g) separating the selected chemical from the webbing.

4,530,764

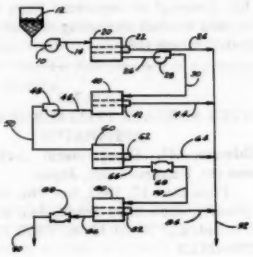
DENSIFICATION OF PHOSPHATIC WASTES AND PHOSPHORIC ACID SLIMES AND SOLVENT RECOVERY

Iran L. Thomas, Tustin, and Chung J. Lai, Placentia, both of Calif., assignors to Occidental Research Corporation, Irvine, Calif.

Filed Jul. 18, 1983, Ser. No. 514,396

Int. Cl.³ B01D *13/00;* **C02F** *1/44*

U.S. Cl. 210—637 **30 Claims**



1. A process for dewatering an aqueous mixture which consists essentially of suspended solids and soluble values of phosphatic waste and water produced during the mining and beneficiation of phosphate ore comprising the steps of:

(a) introducing an aqueous mixture consisting essentially of suspended solids and soluble values of phosphatic wastes and water into a crossflow filter having a filter with a filtering surface on one side in contact with said mixture and a permeate surface on the other side, said filter hydraulically separating an aqueous permeate consisting essentially of water and soluble values of phosphatic waste from said aqueous mixture, said crossflow filter operable for separating by filtration the aqueous permeate from said mixture;

(b) maintaining the flow rate of said mixture over said filtering surface at a velocity of at least about 5 ft/sec to prevent the formation of a filter cake on the filtering surface of said filter, said filtering surface having a layer of solid particulates of not more than 100 microns in thickness formed by said suspended solids inthe course of the filtration of said aqueous mixture; and

(c) dewatering said aqueous mixture by separating the aqueous permeate from said mixture by filtration through said filter to form a dewatered aqueous mixture containing water, soluble values of the phosphatic waste and the suspended solids of the phosphatic waste.

4,530,765

PROCESSES USING CALCINED, HIGH SURFACE AREA, PARTICULATE MATTER, AND ADMIXTURE WITH OTHER AGENTS

Inderjit H. Sabherwal, Los Angeles, Calif., assignor to Ensotech, Inc., North Hollywood, Calif.

Division of Ser. No. 378,081, May 14, 1982, Pat. No. 4,440,867. This application Mar. 20, 1984, Ser. No. 591,609

Int. Cl.³ B01D *15/00*

U.S. Cl. 210—663 **10 Claims**

1. A treatment process comprising:

contacting aqueous material with calcined particulate matter;

said aqueous material containing inorganic, organic, or both impurity in water solution, water dispersion, or both;

whereby at least a significant amount of said impurity is removed from the water portion of said aqueous material by interaction of said impurity with said calcined particulate matter;

where said calcined particulate matter is high surface area

particulate matter produced by calcining, a charge of feeding particulate matter selected from the group consisting of clay mineral, feldspar, zeolite, coal ash, fly ash, pozzolan and volcanic ash, at a temperature above about 1100° C., for a time sufficient to develop fractures extending from the surface of the calcined particulate matter, which fractures increase substantially the surface area of the calcined particulate matter over the surface area of said feed particulate matter.

4,530,766

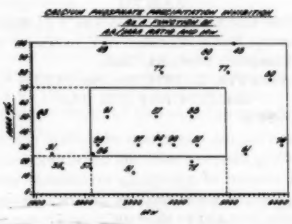
METHOD OF INHIBITING SCALING IN AQUEOUS SYSTEMS WITH LOW MOLECULAR WEIGHT COPOLYMERS

William M. Hann, Pennsburg, and John Natoli, Ambler, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 485,560, Apr. 15, 1983, abandoned. This application Sep. 24, 1984, Ser. No. 653,998

Int. Cl.³ C02F 5/10

U.S. Cl. 210—701 **11 Claims**



1. A method for controlling hardness ion salt scale formation, where said anions of said salt include phosphate, in an aqueous system comprising adding a scale-inhibiting amount of a low molecular weight, water-soluble copolymer to said system to inhibit the precipitation of said hardness ion salts and to disperse precipitated hardness ion salts in said system, said copolymer being an acrylic acid-methacrylic acid copolymer formed from about 30 to about 70 weight percent acrylic acid and about 70 to about 30 weight percent methacrylic acid, and where said copolymer has a weight average molecular weight of from about 2000 to about 5000.

4,530,767

METHOD OF OIL COAGULATION UTILIZING ENTRAINED GAS

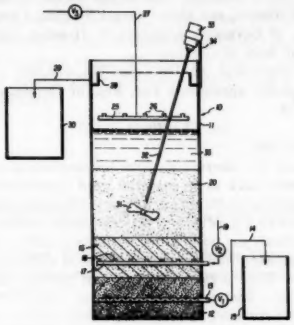
Gene Hirs, 8228 Goldie St., Walled Lake, Mich. 48088

Continuation of Ser. No. 27,441, Apr. 5, 1979, abandoned. This application Aug. 22, 1980, Ser. No. 180,344

Int. Cl.³ B01D 23/10

U.S. Cl. 210—708 **1 Claim**

1. In a method of separating an oil-water mixture, the steps of entraining a gas into the oil-water mixture, flowing the mixture with the entrained gas through a bed of individual, naturally occurring media particles of fruit pit shells or nut shells of a size ranging from about 20 mesh to about 60 mesh and having a water wetting-to-oil wetting ratio of at least about three, agglomerating and entrapping the oil in interstices of the



bed, and recovering from the bed water which is substantially free of oil.

4,530,768

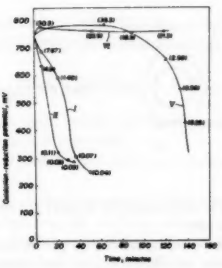
METHOD FOR THE DISPOSAL OF WASTE WATER CONTAINING IRON-CYANIDE COMPLEXES

Koichi Tanihara, Ogoori; Keiko Tamai, and Seiji Yasuda, both of Tosu, all of Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed Feb. 6, 1984, Ser. No. 577,354

Int. Cl.³ C02F 1/70

U.S. Cl. 210—719 **12 Claims**



1. A method for removing iron-cyanide complexes from waste water containing iron-cyanide complexes including ferricyanides which comprises the steps of:

(a) adjusting the content of zinc ions in the waste water so that the waste water contains at least 2 moles of zinc ions per mole of the ferricyanides; and

(b) mixing with the waste water of sulfite selected from the group consisting of sulfites, hydrogen-sulfites and pyrosulfites of alkali metals and a thiosulfate selected from the group consisting of alkali metal thiosulfates and ammonium thiosulfate, in amounts sufficient to reduce the ferricyanides to ferrocyanides and in a molar proportion of the sulfite to the thiosulfate in the range from 1:10 to 6:1 at a pH effective to reduce and precipitate the iron cyanide complexes in the form of zinc ferrocyanide; and

(c) removing the thus precipitated zinc ferrocyanide from the waste water.

4,530,769

PROCESS FOR SEPARATING CARBON BLACK FROM AN AQUEOUS SUSPENSION

Manfred Wolter; Friedrich-Wilhelm Dorn, both of Hürth; Gero Heymer, Erftstadt, and Hans-Werner Stephan, Cologne, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 29, 1983, Ser. No. 479,965

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1982, 3215178

Int. Cl.³ B01D *29/10*

U.S. Cl. 210—769 2 Claims

1. A process for filtering an aqueous suspension containing ash and carbon black as its essential solid constituents, which comprises making synthesis gas by subjecting petroleum distillation residues to a gasification process under pressure, scrubbing the synthesis gas with water with the resultant formation of said suspension, filtering said suspension with the aid of a tube pressure filter arranged in upright position and being operated under a final pressing pressure of 30 to 100 bars with the resultant formation of a filter cake being at least 2 mm thick and containing at least 17% solid matter, releasing the pressing pressure from said tube pressure filter with the resultant re-expansion and disintegration of said filter cake into a plurality of small, irregularly shaped, mechanically strong, ungreasy, flat platelets having an apparent density, in moist condition, of 600 to 650 g/l.

4,530,770

PHENOL-HINDERED PHENOL BORATES AND LUBRICANT COMPOSITIONS CONTAINING SAME

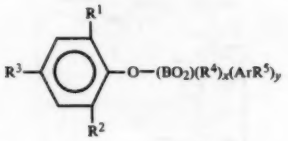
Milton Braid, deceased, late of Haddonfield, N.J. (by Gerassimos Frangatos, executor), assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 16, 1983, Ser. No. 523,524

Int. Cl.³ C10M *1/54*

U.S. Cl. 252—49.6 25 Claims

1. A lubricant composition comprising a major proportion of a a lubricating oil or grease therefrom and an antioxidant amount of a compound of the formula

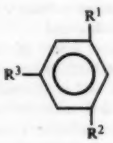


wherein

R^1 and R^2 are tertiary alkyl or aralkyl groups containing 4 to 8 carbon atoms;

R^3 is hydrogen or a hydrocarbyl group containing 1 to 18 carbon atoms, an alkoxy group containing 1 to 16 carbon atoms, an alkylaminomethylene group containing 4 to 16 carbon atoms or an alkylcarboxymethylene group containing 3 to 16 carbon atoms;

R^4 is hydrogen, a



group, or a C_1 to C_6 alkyl group;

Ar is a C_6 to C_{12} aromatic group;

R^5 is an alkoxy group containing 1 to 16 carbon atoms, an alkylaminomethylene group containing 4 to 16 carbon atoms or an alkylcarboxymethylene group containing 3 to 16 carbon atoms; a hydroxy group, a hydroxyarylthio group or a hydroxyarylamino group;

x is from 0 to 2; and

y is 1 or 2.

4,530,771

LUBRICATING OIL COMPOSITIONS

Takaharu Nakano, Yokohama; Akihiro Mochizuki, Tokyo; Morikuni Nakazato, Yamato, and Tatsuro Tsuneno, Wakayama, all of Japan, assignors to Karonite Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 26, 1983, Ser. No. 517,440

Claims priority, application Japan, Aug. 3, 1982, 57-135375

Int. Cl.³ C10M *1/54*

U.S. Cl. 252—49.6 2 Claims

1. In lubrication oil composition comprising as its essential component esters constituted with a glycerol, fatty acid and a boric acid, said esters having a positive amount up to 2.0 mols of a carboxylic acid residue comprising a saturated or unsaturated alkyl group having 8 to 24 carbon atoms and 1.5 to 2.0 mols of a glycerol residue, both per unit mol of a boric acid residue on average of the boric esters used singly or in combination, molar proportion between said carboxylic acid residue and said glycerol residue being that the glycerol residue is 1.2 mols or more based on 1 mol of the carboxylic acid residue.

4,530,772

METHOD OF ELECTRICAL CONTACT LUBRICATION

Peter E. Timony, Valley Cottage, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 22, 1984, Ser. No. 582,351

Int. Cl.³ C10M *1/26, 3/20*

U.S. Cl. 252—56 S 9 Claims

1. A method for the lubrication of electric contacts which comprises adding thereto a lubricant consisting essentially of a predominant amount of a partially crosslinked polyol ester, which is the esterification reaction product of an aliphatic monocarboxylic acid and an aliphatic polyol in the presence of a dibasic acid crosslinker, a lesser amount of a phosphate ester fluid and at least one inhibitor compound.

4,530,773

WORKING FLUIDS FOR RANKINE CYCLE

Naonori Enjo, Suita; Masahiro Noguchi, Osaka, and Satoshi Ide, Settsu, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Nov. 28, 1983, Ser. No. 555,336

Claims priority, application Japan, Dec. 3, 1982, 57-213165; Dec. 3, 1982, 57-213166

Int. Cl.³ C09K *5/04*

U.S. Cl. 252—67 1 Claim

1. Working fluids for the Rankine cycle comprising 90 to 10% by weight dichlorotetrafluoroethane and about 10 to about 40% by weight difluoroethane.

4,530,774

FABRIC WASHING PROCESS AND DETERGENT COMPOSITION FOR USE THEREIN

James F. Davies, Merseyside; Andrew T. Hight, Cheshire, and Robert S. Lee, Merseyside, all of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Nov. 30, 1983, Ser. No. 556,659

Claims priority, application United Kingdom, Dec. 17, 1982, 8236004

Int. Cl.³ C11D *17/06*

U.S. Cl. 252—108 8 Claims

1. A particulate solid detergent composition comprising:

(i) a non-soap detergent active material;

(ii) an alkaline material capable of providing the composition with a pH of more than 8.0, when added to water of 12°

French hardness (Ca) at 25° C. and at a concentration of 1.0 g/l; and

(iii) at least 10% by weight of a builder material,

said builder material consisting essentially of a saturated fatty acid which contains at least 16 carbon atoms and said fatty acid is in the form of discrete particles having a particle size of between 50 microns and 5000 microns and comprising said fatty acid in a heterogenous mixture with a water-soluble or water-dispersible carrier material; said carrier material is selected from the group consisting of inorganic water-soluble salts, inorganic water-insoluble materials, water-soluble film forming materials, synthetic polymers, proteins and water-soluble organic materials selected from carbohydrates and polyhydric alcohols.

4,530,775

STABLE LIQUID DETERGENT SUSPENSIONS

John M. Brierley, and Melvin Scott, both of South Wirral, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Nov. 8, 1982, Ser. No. 439,709

Claims priority, application United Kingdom, Nov. 13, 1981, 8134309

Int. Cl.³ C11D *3/14, 7/12, 7/16, 9/18*

U.S. Cl. 252—128 **3 Claims**

1. An aqueous liquid abrasive cleaning composition comprising 1–65% of a non-colloidal undissolved particulate abrasive material stably suspended in an aqueous liquid medium, said medium comprising

from 0.5 to 15% by weight of an anionic detergent active material, from 1 to 6% by weight of an electrolyte salt mixture of sodium carbonate and sodium tripolyphosphate dissolved in said aqueous liquid medium, and

from 0.3 to 5% by weight of C_8–C_{24} fatty acid monoalkylolamide wherein the alkylol group contains from 1 to 4 carbon atoms.

4,530,776

CLEANING COMPOSITION FOR WAX REMOVAL

Iwao Hisamoto, Suita, and Yukio Omure, Takatsuki, both of Japan, assignors to Kaikin Kogyo Co., Ltd., Osaka, Japan

Filed Feb. 23, 1984, Ser. No. 582,761

Claims priority, application Japan, Feb. 28, 1983, 58-32517

Int. Cl.³ B08B *3/08, 3/12;* **C11D** *7/30, 7/50*

U.S. Cl. 252—153 **1 Claim**

1. A cleaning composition comprising tetrachlorodifluoroethane, 2,2,3,3-tetrafluoropropyl alcohol and nitromethane in a ratio of 80:13.3:6.7 by weight.

4,530,777

POLYURETHANE FOAMS AND PROCESSES FOR PREPARATION

Richard B. Kennedy, Ridgefield, Conn., assignor to Crehan & Fricke, Ridgefield, Conn.

Division of Ser. No. 496,418, May 20, 1983, which is a division of Ser. No. 443,878, Nov. 23, 1982, which is a continuation-in-part of Ser. No. 328,686, Dec. 8, 1981. This application Jul. 29, 1983, Ser. No. 518,542

Int. Cl.³ C08G *18/14*

U.S. Cl. 252—182 **6 Claims**

1. A mixture useful for the preparation of polyurethane foams consisting of polyisocyanate, a surfactant, a blowing agent and a flame retardant.

4,530,778

CONDUCTIVE COATINGS

Ronald S. Nelson, Trinity, and John D. Loflin, Jamestown, both of N.C., assignors to The Lilly Company, High Point, N.C.

Filed Jul. 11, 1983, Ser. No. 512,549

Int. Cl.³ H01B *1/00*

U.S. Cl. 252—500 **14 Claims**

1. A conductive pretreatment solution comprising a volatile liquid carrier selected from the group consisting of water and organic solvents, said carrier having dissolved therein, per 100 parts by volume of total solution, (1) from 0.2 to 3 parts by volume of an organic quaternary ammonium compound having a molecular weight below about 1000, (2) from 0.2 to 10 parts by volume of a low volatile liquid polyol having a molecular weight below about 400, and (3) from 0.1 to 3 parts by weight of an inorganic ionizable salt having a capacity to absorb moisture.

4,530,779

CONDUCTIVE SYNTHETIC RESIN MOLDING MATERIAL

Toshio Mayama, Kawaguchi, and Hidehiro Iwase, Tokyo, both of Japan, assignors to Toshiba Chemical Products Co., Ltd., Tokyo, Japan

Filed Oct. 11, 1983, Ser. No. 540,563

Claims priority, application Japan, Jul. 11, 1983, 58-124734; Jul. 11, 1983, 58-124735

Int. Cl.³ C08K *7/04*

U.S. Cl. 252—507 **15 Claims**

1. A conductive synthetic resin molding material comprising: master pellets consisting of a cylindrical synthetic resin layer and a bundle of a number of strands of fibrous conductive filler filled inside said synthetic resin layer in a longitudinal direction thereof, the master pellets being cut in the form of pellets; and natural pellets consisting of a synthetic resin.

4,530,780

LIQUID DETERGENT COMPOSITION CONTAINING STABILIZING ELECTROLYTE MIXTURES

Johannes C. van de Pas; Frederik van Voorst Vader, both of Vlaardingen, and Wilhelmina K. Toet, The Hague, all of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Nov. 8, 1982, Ser. No. 439,959

Claims priority, application United Kingdom, Nov. 16, 1981, 8134409

Int. Cl.³ C11D *3/14, 9/20*

U.S. Cl. 252—528 **2 Claims**

1. An aqueous built liquid detergent composition of the suspending type which comprises:

(i) 5 to 35% by weight of a detergent active material comprising:

(a) a nonionic detergent active material selected from the group consisting of tertiary amine oxides, alkylene oxide condensation products of alcohols, alkyl phenols, fatty acids and of fatty acid amides; and

(b) an anionic detergent active material, a cationic detergent active material or mixtures thereof;

wherein the weight ratio of component (a) to component (b) lies between 1:1 and 1:5; and

(ii) a mixture of electrolytes, said mixture comprising:

(a) 5 to 30% by weight of an electrolyte having a salting-out effect on component (a) of said nonionic detergent active material, selected from the group consisting of the alkali metal and ammonium salts of orthophosphates, pyrophosphates, tripolyphosphates, silicates, disilicates, borates, carbonates, sulfates, citrates, nitrilotriacetates, carboxymethyloxy succinates and mixtures thereof; and

(b) 2 to 25% by weight of an auxiliary electrolyte having a lyotropic number of at least 9.5, selected from the group consisting of the alkali metal and ammonium salts of iodides, chlorates, perchlorates, rhodanides, nitrates, bromides, chlorides and mixtures thereof.

4,530,781

METASTABLE PRESPOTTING COMPOSITION

Mark M. Gipp, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Oct. 12, 1983, Ser. No. 541,202
Int. Cl.[3] C11D *1/40*
U.S. Cl. 252—546 20 Claims

1. A metastable prespotting laundry composition consisting essentially of;

(a) from about 0.25 to 10% by weight of a chelating agent selected from the group consisting of salts of ethylenediaminetetraacetic acid, salts of diethylenetriaminepentaacetic acid, salts of (N-hydroxyethyl)ethylenediaminetriacetic acid, salts of nitrilotriacetic acid and mixture thereof;

(b) from about 1 to 35% by weight of at least one nonionic surfactant selected from the group consisting of ethoxylated nonylphenols, ethoxylated octylphenols, ethoxylated secondary fatty alcohols, ethoxylated primary fatty alcohols, ethoxylated sorbitan fatty acid esters, sorbitan fatty acid esters and mixtures thereof, wherein the surfactant has an HLB such that the combined HLB for all surfactants present is within the range of from 9 to 13;

(c) from about 5 to 60% by weight of a solvent selected from the group consisting of isoparaffinic hydrocarbons, deodorized kerosene, mineral spirits, terpenes, chlorinated hydrocarbons, an isoparaffinic hydrocarbon mixed with less than 5% of a solvent selected from the group consisting of terpenes, chlorinated hydrocarbons, aromatics, ethers and mixtures thereof, or mixtures of any of said solvents; and

(d) water

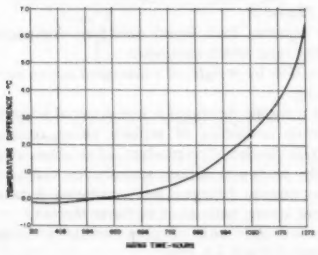
wherein the composition has a pH of from 4.5 to 12.2.

4,530,782

ELECTRICAL APPARATUS HAVING AN IMPROVED LIQUID DIELECTRIC COMPOSITION

William R. Meyer, Cassville, Wis., assignor to McGraw-Edison Company, Elgin, Ill.

Continuation-in-part of Ser. No. 428,964, Sep. 30, 1982, abandoned, which is a continuation of Ser. No. 247,530, Mar. 25, 1981, abandoned. This application Feb. 2, 1984, Ser. No. 576,157
Int. Cl.[3] H01B *3/22*
U.S. Cl. 252—578 7 Claims



1. An electrical apparatus for use in high fire point applications, comprising an outer casing, a pair of electrical conductors disposed within the casing, a dielectric material separating the conductors, and a liquid dielectric composition impregnating said dielectric material and comprising from 1% to 25% by weight of a low molecular weight hydrocarbon oil having a molecular weight distribution peak in the range of 460 to 510, 40% to 80% by weight of a high molecular weight hydrocarbon oil having a molecular weight distribution peak in the range of 600 to 720, and the balance being a polyalphaolefin, said polyalphaolefin having from 8 to 12 carbon atoms in the olefin monomer and having a molecular weight distribution peak in the range of 320 to 600, said liquid dielectric composition having a fire point above 300° C. and a pour point at least as low as −20° C.

4,530,783

COMPOSITION OF MATTER SUITABLE FOR SOLIDIFYING RADIOACTIVE WASTES, PRODUCTS BASED ON SAID COMPOSITION WHEREIN RADIOACTIVE WASTES ARE SOLIDIFIED AND PROCESS FOR OBTAINING SAID PRODUCTS

Luigi Arcuri, Bracciano; Elvio Bertotti, Colleferro; Giancarlo Carignani, Rome; Aldo Cipriani, Colleferro; Aldo Donato, and Giuseppe Grossi, both of Rome, all of Italy, assignors to Snial Resine Poliestere S.p.A., Frosinone and Comitoto Nazionale Per L'Energia Nucleare, Marghenta, both of, Italy

Filed Mar. 9, 1982, Ser. No. 356,344
Claims priority, application Italy, Mar. 9, 1981, 20224 A/81
Int. Cl.[3] G21F *9/16*
U.S. Cl. 252—628 5 Claims

1. Composition of matter suitable for solidifying radioactive wastes, said composition being formed of unsaturated polyester resins comprising:

an unsaturated polyester (I) obtained by polycondensation of:

(a) maleic anhydride and/or maleic acid and/or fumaric acid;

(b) isophthalic acid and/or terephthalic acid;

(c) neopentylglycol;

(d) optionally one or more conventional glycols chosen from the group consisting of ethylene glycol and 1,2-propylene glycol,

the component (c) of said unsaturated polyester (I) being present in an amount of at least of 50% by mols with respect to the sum of components (c)+(d);

an unsaturated polyester (II) obtained by polycondensation of:

(a) maleic anhydride and/or maleic acid and/or fumaric acid;

(b) isopropylidene-bis-(phenyleneoxy-propanol-2)

(c) optionally one or more conventional glycols, chosen from the group consisting of ethylene glycol, 1,2-propylene glycol, and neopentyl glycol,

component (b) of said unsaturated polyester (II) being present in an amount of at least 50% by mols, with respect to the sum of components (b)+(c);

an ethylenically unsaturated liquid monomer (III) capable of being copolymerized with the unsaturated polyesters (I) and (II), selected from the group consisting of styrene, vinyltoluene, methylmethacrylate and their mixtures; inhibitors, polymerization initiators, accelerators, glass fibers and other conventional additives and fillers; the weight ratio of the aforesaid components (I) and (II) being comprised between 80:20 and 40:60.

4,530,784

LARGE SCALE EXTRACTION PROCESS FOR CONTACT INHIBITORY FACTOR

Martin J. Rosenberg, Brooklyn, N.Y., assignor to New York University, New York, N.Y.

Filed Aug. 19, 1983, Ser. No. 524,917
Int. Cl.[3] A61K *35/00*
U.S. Cl. 260—112 R 14 Claims

1. A method for obtaining a biologically active factor that restores contact inhibition of growth to malignant cell types, from media conditioned by growth therein of a contact-inhibited cell culture, which comprises

mixing said media with a volatile non-denaturing precipitating agent to form a precipitate,

separating said precipitate from said mixture,

extracting said precipitate with a biologically acceptable ionic buffer,

agitating said precipitate and said buffer,

centrifuging the buffer and precipitate, and

collecting the supernatant buffer from said centrifuging operation and recovering said factor from said buffer, said factor being obtained in substantially higher quantity and yield than that resulting from use of hydrophobic interaction chromatography for isolating said factor from said media.

4,530,785

PROCESS FOR THE PURIFICATION OF MICROBIAL PROTEIN ISOLATES

Udo Scharf, Kelkheim, and Merten Schlingmann, Königstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 18, 1984, Ser. No. 601,697

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1983, 3314292

Int. Cl.[3] A23J *1/18*

U.S. Cl. 260—112 R 18 Claims

1. A process for the purification of microbial protein isolates, which comprises treating defatted microbial cells by suspending the defatted microbial cells in an aqueous solution of a phosphate and/or a hydrophilic low molecular weight aliphatic compound which contains at least two radicals selected from the group consisting of hydroxy, formyl, keto and carboxy and isolating the protein residue.

4,530,786

ANTIBODY FOR THE DETECTION AND QUANTIFICATION OF ATRAZINE

Bohn D. Dunbar, Akron; Gordon D. Niswender, and James M. Hudson, both of Fort Collins, all of Colo., assignors to Colorado State University Research Foundation, Fort Collins, Colo.

Filed Sep. 4, 1984, Ser. No. 647,044

Int. Cl.[3] C07G *7/00*

U.S. Cl. 260—112 B 3 Claims

1. The antibody for the immunoassay of atrazine made by the process of first derivatizing 2-chloro-4(isopropylamino)-6-(ethylamino)-S-atrazine by substituting a soluble straight chain amino acid having at least four carbon atoms at either the 4 or the 6 position so as to leave the chlorine exposed at the 2 position and one of the amino groups exposed at the 4 or the 6 position, then conjugating the resulting derivative at the site of the amino acid substitution to a lysine-rich protein using the mixed anhydride method in a strongly-basic aqueous solution to produce the antigen, next inoculating a susceptible host with the antigen to evoke an immune response and thereafter harvesting the antibody from the host.

4,530,787

CONTROLLED OXIDATION OF MICROBIALLY PRODUCED CYSTEINE-CONTAINING PROTEINS

Ze'ev Shaked, Berkeley, and Sidney N. Wolfe, Richmond, both of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 594,351, Mar. 28, 1984, abandoned. This application Oct. 17, 1984, Ser. No. 661,902

Int. Cl.[3] C07G *7/00;* A61K *45/02*

U.S. Cl. 260—112 R 22 Claims

1. A preparative process for oxidizing a microbially produced synthetic protein having fully reduced cysteines and having an amino acid sequence substantially identical to a useful protein which sequence includes cysteines which in the useful protein are linked intramolecularly to form a cystine in a controlled manner whereby said cysteines are oxidized selectively to form said cystine with minimal overoxidation and formation of nonconforming cysteine groups or oligomers comprising reacting the fully reduced microbially produced synthetic protein with o-iodosobenzoate in an aqueous medium at a pH at least about one-half pH unit below the pK_a of said cysteines and wherein the concentration of synthetic protein in the reaction mixture is less than about 5 mg/ml and the mol ratio of o-iodosobenzoate to protein is at least stoichiometric, with the proviso that the o-iodosobenzoate is in excess in the terminal portion of the reaction.

17. A cystine-containing protein preparation derived from a synthetic microbially produced, unglycosylated protein having fully reduced cysteines and having an amino acid sequence substantially identical to a useful protein which sequence includes cysteines which is the useful protein are linked intramolecularly to form a cystine, which preparation consists essentially of a cystine-containing protein which:

(i) has the same disulfide bridging as the native useful protein;

(ii) is substantially free of oligomers; and

(iii) contains less than about 15% by weight of isomers having disulfide bridging different from the native useful protein.

4,530,788

OIL SEED PROTEINS EVIDENCING IMPROVED FUNCTIONALITY

Pei K. Chang, Montrose, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 3, 1982, Ser. No. 446,827

Int. Cl.[3] A23J *1/14*

U.S. Cl. 260—123.5 19 Claims

1. A process for treating extracted vegetable protein which comprises:

1. adjusting the pH of an aqueous solution of extracted vegetable protein having from about 70% to about 95% protein wherein at least a major proportion of the protein is insoluble at its isoelectric point, said protein being soluble in alkaline solution, to a pH within the range of from about 7.5 to about 12, the total solids of said solution ranging from about 5% to about 10% by weight, and the total dissolved protein content ranging from about 3.5% to about 9.5% by weight when determined at said pH;
2. heating the alkaline solution of step (1) to an elevated temperature within the range of from about 70° C. to about 121° C. for less than 1 hour and at a rate sufficient to produce the desired increase in viscosity and insufficient to provide a reduction in solubility; and
3. cooling said heated solution to a temperature below 60° C. and sufficient to retard further substantial change in the protein.

4,530,789

SUBVALENT HALIDE COMPOUNDS TETRASELENOFULVALENE AND TETRATHIOFULVALENE SUBVALENT HALIDES

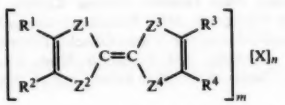
James D. Wilson, University City, and Malcolm G. Miles, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 536,147, Dec. 24, 1974, abandoned. This application Oct. 16, 1979, Ser. No. 85,351

Int. Cl.[3] C07D *421/04, 409/02*

U.S. Cl. 260—239 R 12 Claims

1. Subvalent organic halide compounds having the formula

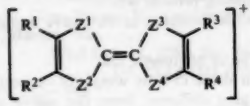


where m is equal to 1 and n is a positive number of from about 0.5 to about 0.9; R^1, R^2, R^3 and R^4 are each independently selected from the group consisting of hydrogen, or a normal alkyl group having 1 to 7 carbon atoms per group, Z^1, Z^2, Z^3 and Z^4 are either all sulfur or all selenium and x is at least one of chlorine, iodine, or bromine; and the compounds are electrical conductors at room temperature.

7. Double cation subvalent halide compounds having the formula:

$$(O)_a(M)_b(X)_c$$

where (O) is the organic cation having the formula:



R^1, R^2, R^3, and R^4 are each independently selected from the group consisting of hydrogen, or a normal alkyl group having from 1 to 7 carbon atoms per group; Z^1, Z^2, Z^3 and Z^4 are either all sulfur or all selenium; (M) is copper; (X) is at least one of chlorine, bromine, or iodine; a is an integer of one or more; b is a positive number less than c, and the integer a is greater than c-b and the compounds are electrical conductors at room temperature.

4,530,790

CHOLECYSTOKININ ANTAGONISTS

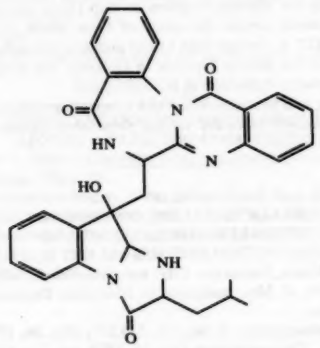
Richard L. Monaghan, Somerset; Michael A. Goetz, Fanwood, and Raymond S. L. Chang, Edison, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 453,383, Dec. 27, 1982, abandoned. This application Jul. 1, 1983, Ser. No. 509,883

Int. Cl.[3] **C07D** *519/00;* **A61K** *31/55;* **C12P** *17/18;* **C12R** *1/66*

U.S. Cl. 260—239.3 P **10 Claims**

1. The compound having the Formula I:



I

and pharmaceutically acceptable salts thereof.

4,530,791

β-LACTAM ANTIBIOTICS

Masahito Nakayama; Akio Iwasaki; Shigeru Kimura; Sohei Tanabe; Toshimi Mizoguchi; Akira Murakami; Isamu Watanabe, all of Higashi-Murayama; Masao Okuchi, Tokorozawa; Hisakatsu Ito, Kawagoe, and Toshihito Mori, Higashi-Murayama, all of Japan, assignors to Kowa Co., Ltd., Nagoya, Japan

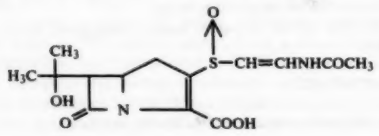
Filed Apr. 4, 1980, Ser. No. 137,259

Claims priority, application Japan, Apr. 16, 1979, 54-46516; Sep. 17, 1979, 54-119139

Int. Cl.[3] **C07D** *487/04;* **A61K** *31/40*

U.S. Cl. 260—245.2 T **3 Claims**

1. An antibiotic substance represented by the formula



4,530,792

PROCESS AND INTERMEDIATES FOR PREPARATION OF 1,1-DIOXOPENICILLANOYLOXYMETHYL 6-BETA-AMINOPENICILLANATE

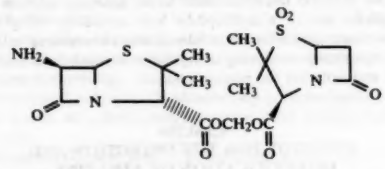
Paul D. Weeks, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Nov. 1, 1982, Ser. No. 438,228

Int. Cl.[3] **C07D** *499/42;* **A61K** *31/425*

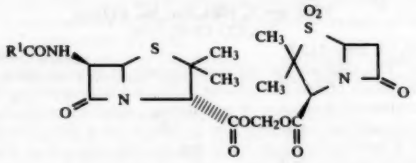
U.S. Cl. 260—245.2 R **10 Claims**

1. A process for preparation of a compound of the formula



which comprises the steps of

(a) contacting a compound of formula



wherein R^1 is $C_6H_5CH_2$ or $C_6H_5OCH_2$, under anhydrous conditions with a halogenating agent in the presence of a reaction inert organic solvent and a tertiary amine at a temperature of from −70° to 20° C. to form an imino halide;

(b) contacting said imino halide with a primary alcohol of the formula R^2OH where R^2 is alkyl having from one to four carbon atoms, at a temperature of from −70° to 0° C. to form an imino ether;

(c) contacting said imino ether with water at a temperature of from −70° to 0° C.

4,530,793

PROCESSES FOR THE PRODUCTION OF PENEMS

Viyyoor M. Girijavallabhan, Parsippany; Ashit K. Ganguly, Upper Montclair; Patrick A. Pinto, Mine Hill, and Richard W. Versace, Ringwood, all of N.J., assignors to Schering Corporation, Madison, N.J.

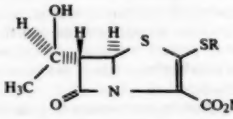
Filed Nov. 29, 1982, Ser. No. 445,295

The portion of the term of this patent subsequent to Apr. 17, 2001, has been disclaimed.

Int. Cl.[3] **C07D** *499/00;* **A61K** *31/545*

U.S. Cl. 260—245.2 R **3 Claims**

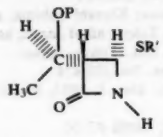
1. A process of the production of penems of formula



I

wherein R is a pharmaceutically acceptable organic radical and M is hydrogen or an alkali metal cation; which comprises

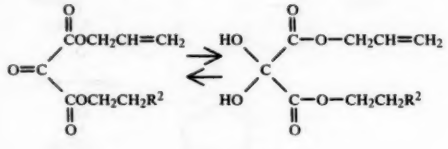
(a) reaction of an azetidinone of the formula



III

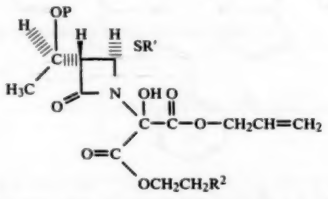
wherein P is a removable hydroxy protecting group; and R^1 is a sulfur protecting group selected from triphenylmethyl, 2-pyranyl, or lower alkyl carbonyl; with a compound of the formula IVa and IVb

H_2O +



IVa IVb

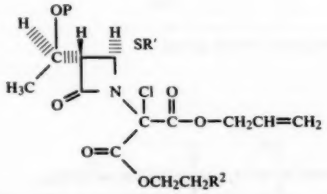
wherein R^2 is trimethylsilyl, t-butyldiphenylsilyl or other equivalently functioning lower alkylsilyl groups; to form the intermediate of the formula V



V

wherein P, R^1 and R^2 are hereinabove defined;

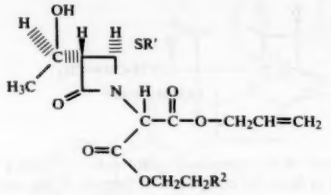
(b) treatment of the compound of formula V with a chlorinating agent to form the following compound of formula VI



VI

wherein P,R^7 and R^2 are as defined hereinabove;

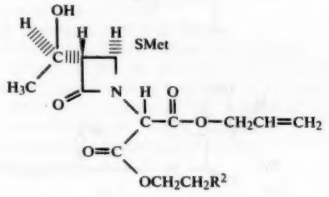
(c) treatment of the compound of formula VI with elemental zinc to effect removal of the chlorine and the removable hydroxy protecting group, and, if a removable hydroxy protecting group is utilized which is not removable with zinc, subsequent removal of said hydroxy protecting group, producing a compound of formula VII



VII

wherein R^7 and R^2 are hereinabove defined;

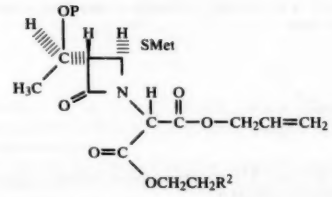
(d) treatment of the compound of formula VII with a reactive silver, copper or mercury salt to form the compound of formula VIII



VIII

wherein R^2 is defined hereinabove and Met is silver, copper or mercury;

(e) treatment of the compound of formula VIII with a hydroxy protecting group to form the compound of formula IX



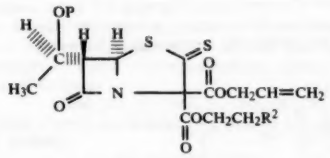
IX

wherein R^2, P and Met are defined hereinabove;

(f) reaction of the compound of formula IX with a thiocarbonyl compound of formula X

(X)

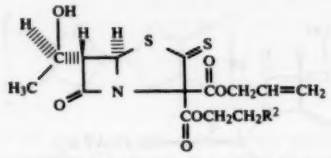
wherein Y is a leaving group; to form a compound of formula XI



XI

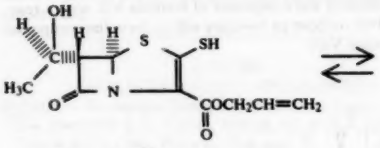
wherein P and R^2 are as hereinabove defined;

(g) treatment of the compound of formula XI with an aqueous acid solution to form a compound of formula XII

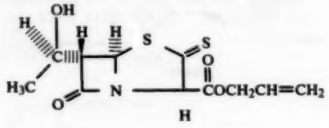


XII

(h) treatment of the compound of formula XII with a fluoride ion to form the compound of formula XIIIa which is tautomeric with formula XIIIb



XIII(a)

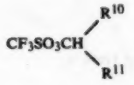


XIII(b)

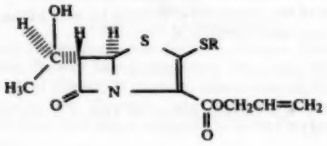
(i) reaction of the compound of formulas XIII(a) and XIII(b) with either a compound of the formula XIV

RZ (XIV)

wherein R is as defined hereinabove and Z is a leaving group or with



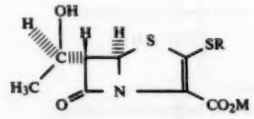
wherein R^{10} and R^{11} are hereinabove defined to form a compound of formula XV



XV

wherein R is defined above;

(j) treatment of a compound of formula XV under conditions to remove the allyl protecting group in the presence of an alkali base to form the compounds of formula I



I

wherein R and M are as hereinabove defined.

4,530,794

IRON-TETRAPHENYLPORPHINE COMPLEX HAVING PHOSPHOCHOLINE GROUP

Yoh-ichi Matsushita; Etsuo Hasegawa; Kiyoshi Eshima, all of Tokushima, and Eishun Tsuchida, Tokyo, all of Japan, assignors to Taiho Pharmaceutical Co., Ltd., Tokyo, Japan

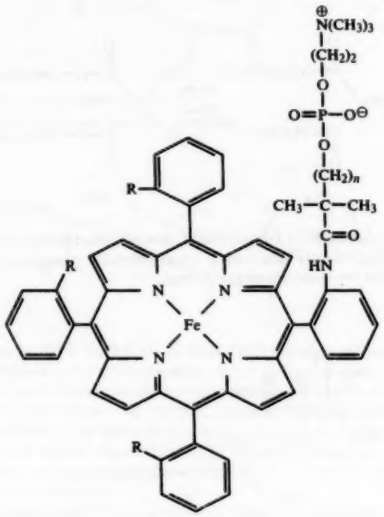
Filed Nov. 28, 1983, Ser. No. 555,474

Claims priority, application Japan, Dec. 1, 1982, 57-210840; Dec. 1, 1982, 57-210841

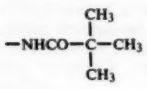
Int. Cl.[3] C07D *487/22;* C09B *47/00*

U.S. Cl. 260—245.91 5 Claims

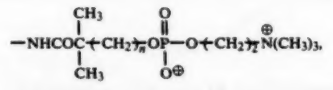
1. An iron-5,10,15,20-tetra(α,α,α,α-o-substituted phenyl)-porphine complex having a structure represented by the general formula:



where each of R is identical and stands for



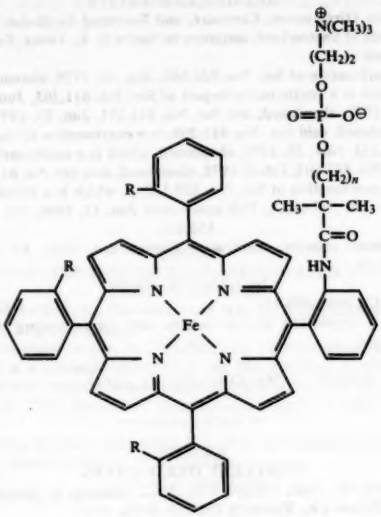
(a pivalamido group) or the group



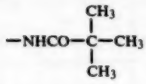
n is an integer from 1 to 20, and the central iron atom is divalent or trivalent.

4. An oxygen adsorbing and desorbing agent comprising:

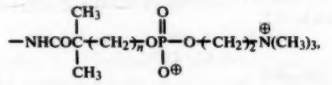
an iron-5,10,15,20-tetra(α,α,α,α-o-substituted phenyl)porphine complex having a structure represented by the general formula:



wherein each of R is identical and stands for



(a pivalamido group) or the group



n is an integer from 1 to 20, and the central iron atom is divalent; and

a basic ligand coordinated at the central iron atom of the complex.

4,530,795

PROCESS FOR PREPARATION OF 16 α-METHYL CORTICOIDS FROM Δ^{16}-STEROIDS

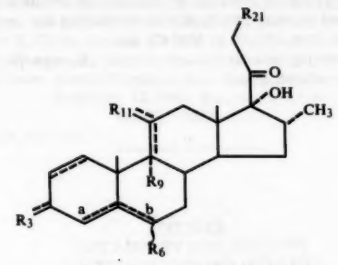
Joel E. Huber, Texas Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 27, 1984, Ser. No. 584,278

Int. Cl.³ C07J *7/00*

U.S. Cl. 260—397.4 **9 Claims**

2. A process for the preparation of a compound of the formula



IV

wherein ---- is optionally a single or double bond with the proviso that when one of --α-- or --β-- is a double bond the other cannot be a double bond;

R_3 is an (O), (H, α-OR) or (H, β-OR) wherein R is hydrogen or a protecting group;

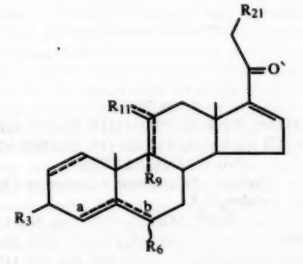
R_6 is hydrogen, methyl or fluoro;

R_9 is hydrogen, fluoro, chloro or bromo;

R_{11} is (H), (H,H), (H, β-chloro), (O), (H, α-OR') or (H, β-OR'), wherein R' is hydrogen or a protecting group;

R_{21} is hydrogen, halogen or OR'' wherein R'' is hydrogen or a protecting group; which comprises:

(1) contacting a compound of formula



III

wherein ---, --α--, --β-- R_3, R_6, R_9, R_{11} and R_{21} are as defined above with methylmagnesium halide in the presence of a copper catalyst;

(2) treating the reaction mixture of step (1) with aryl sulfinyl halide or mixed anhydrides to prepare an enol sulfinate;

(3) adding a thiophile to the reaction mixture of step (2); to obtain the compound having formula IV.

3. A claim according to claim 2 wherein R_3 is (O), R_6 is in the α-position, --α-- is a double bond, --β-- is a single bond, R_{11} is attached to the ring by a single bond and is a hydrogen, α-OR' or β-OR' with the proviso that if R_{11} is OR' then the ---- in ring C is a single bond, and R_{21} is OR''.

4,530,796

PROCESS FOR THE PREPARATION OF ISOCYANATES THROUGH THE THERMAL CLEAVAGE OF URETHANES

Otto Mattner, Speyer; Franz Merger, Frankenthal, and Friedrich Towae, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 25, 1984, Ser. No. 664,782

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1983, 3339300

Int. Cl.³ C07C *69/00*

U.S. Cl. 260—453 P **20 Claims**

1. In a process for the vapor phase pyrolysis of urethanes to isocyanates in the absence of a catalyst, the improvement which comprises:

(a) heating a urethane in the liquid phase under pressure;
(b) pyrolyzing the urethane by injecting the urethane into a reduced pressure pyrolysis zone maintained at a temperature of from 175° C. to 600° C.; and
(c) recovering isocyanate and alcohol cleavage products thus produced.

4,530,797

PROCESS FOR PRODUCING POLYCHLOROBENZONITRILE

Hiroshi Hayami, Takasaki; Yasuo Kuroda, Gunma; Makoto Kikuchi, Takasaki, and Kenji Koshi, Fukuyama, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 10, 1984, Ser. No. 648,745

Int. Cl.³ C07C *120/14*

U.S. Cl. 260—465 C **8 Claims**

1. A process for producing polychlorobenzonitrile having chlorine atoms at the 2,6-position by ammoxidation of toluene derivative having chlorine atoms at the 2,6-position with a gas containing ammonia and oxygen in vapour phase in the presence of a catalyst, characterized in that bromine and/or a bromine-containing compound is added to the reaction system.

4,530,798

COMPOSITIONS, WHICH PROMOTE PLANT GROWTH AND PROTECT PLANTS, BASED ON OXIME ETHERS AND OXIME ESTERS

Henry Martin, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 129,499, Mar. 11, 1980, Pat. No. 4,466,822, which is a division of Ser. No. 881,953, Feb. 27, 1978, abandoned. This application Sep. 30, 1982, Ser. No. 430,110

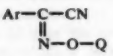
Claims priority, application Switzerland, Mar. 2, 1977, 2606/77; Feb. 8, 1978, 1348/78

The portion of the term of this patent subsequent to Jan. 24, 1999, has been disclaimed.

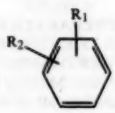
Int. Cl.³ A01N *21/02, 9/20*; C07C *121/66, 121/70*

U.S. Cl. 260—465 E **4 Claims**

1. A compound of the formula



wherein Ar is naphthyl or



in which

R_1 represents hydrogen, halogen, lower alkyl, lower alkoxy or phenoxy in the para-position which is optionally substituted a maximum of twice by halogen, cyano, nitro or trifluoromethyl, and

R_2 represents hydrogen, halogen, nitro or lower alkyl and Q is lower cyano alkyl, with the proviso that, if Ar is unsubstituted phenyl, Q may not be cyanomethyl.

4,530,799

BETAINE DERIVATIVE

Pierre Hirsbrunner, Corseaux, and Raymond Bertholet, Aigle, both of Switzerland, assignors to Nestec S. A., Vevey, Switzerland

Continuation of Ser. No. 920,969, Jun. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 811,203, Jun. 29, 1977, abandoned, and Ser. No. 811,191, Jun. 29, 1977, abandoned, said Ser. No. 811,203, is a continuation of Ser. No. 635,122, Nov. 25, 1975, abandoned, which is a continuation of Ser. No. 547,602, Feb. 6, 1975, abandoned, said Ser. No. 811,191, is a continuation of Ser. No. 635,122, , , which is a division of Ser. No. 547,602, ,. This application Jun. 12, 1980, Ser. No. 158,825

Claims priority, application Switzerland, Mar. 12, 1974, 3412/74

Int. Cl.³ C07C *101/04*

U.S. Cl. 260—501.13 **6 Claims**

1. A crystalline double betaine salt corresponding to the formula

$$(CH_3)_3N^+—CH_2—COO^-.Na^+.Cl^-.2H_2O$$

4,530,800

PERYLENE DERIVATIVES

Kenneth W. Bair, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Jun. 1, 1983, Ser. No. 499,813

Claims priority, application United Kingdom, May 17, 1983, 8313571

Int. Cl.³ C07C *67/02, 87/455*

U.S. Cl. 260—501.21 **8 Claims**

1. 2-methyl-2-((3-perylenylmethyl)amino)-1,3-propanediol.

4,530,801

NOPOL DERIVED SULFONATES

Vincent Lamberti, Upper Saddle River, and Eddie N. Gutierrez, Fort Lee, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Feb. 27, 1984, Ser. No. 583,557

Int. Cl.³ C07C *143/22*

U.S. Cl. 260—503 **4 Claims**

1. p-Menth-6-ene-7-methylol-2-sulfonic acid or its alkali metal, alkaline earth metal, ammonium or alkylolammonium salt.

2. p-Menthane-7-methylol-2-sulfonic acid or its alkali metal, alkaline earth metal, ammonium or alkylolammonium salt.

4,530,802

DI-HYDROCARBYL PHOSPHATE QUATERNARY AMINE SALTS WITH AN AMIDE OF AN AMINO CARBOXYLIC ACID

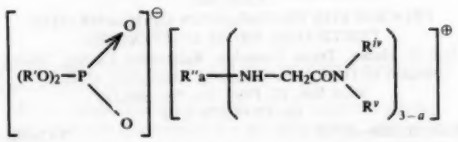
Rodney L. Sung, Fishkill; William M. Sweeney, and Benjamin J. Kaufman, both of Wappingers Falls, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 318,533, Nov. 5, 1981, Pat. No. 4,365,972. This application Sep. 7, 1982, Ser. No. 415,110

Int. Cl.³ C07F *9/09*

U.S. Cl. 260—925 **12 Claims**

1. A novel composition comprising



wherein R′ is alkyl, alkaryl, aralkyl, cycloalkyl, or aryl; each of

R'', R^{iv} and R^{v} is hydrogen, alkyl, cycloalkyl, alkenyl, alkaryl, aralkyl, or aryl; a is 0, 1, or 2; and at least one of R^{iv} and R^{v} is other than hydrogen.

4,530,803

APPARATUS FOR IMPREGNATING WATER WITH CARBON DIOXIDE

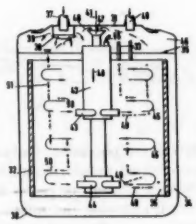
Alexander Kuckens, Harvestehuder Weg 28, 2000 Hamburg 13, Fed. Rep. of Germany

Continuation of Ser. No. 343,876, Jan. 29, 1982, abandoned, which is a continuation of Ser. No. 091,404, Nov. 6, 1979, abandoned, which is a continuation-in-part of Ser. No. 059,264, Jul. 20, 1979, abandoned. This application Oct. 16, 1984, Ser. No. 660,570

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1978, 2832377; Nov. 7, 1978, 2848146

Int. Cl.[3] B01F 3/04

U.S. Cl. 261—29 1 Claim



1. Apparatus for impregnating water with carbon dioxide comprising a pressure tight vessel having a vertical central axis, means for supplying fresh water into the vessel at the top thereof to a predetermined water line to define a head space in the vessel above the water line, means for supplying carbon dioxide gas into the vessel at the top thereof above the water line, a motor submerged in water in the vessel below the predetermined water line located on the vertical central axis of the vessel, a liquid pump within the container on the vertical central axis thereof connected to the motor for rotation thereby, said pump having a suction inlet proceeding circumferentially of the vessel in one direction and said pump having a delivery port proceeding circumferentially of the container in the opposite direction, means for drawing carbon dioxide gas from the head space of the vessel above the water line therein into the pump on actuation of the pump by the motor whereby the carbon dioxide gas and water are mixed in the pump and are delivered from the delivery port of the pump in a mixed condition and traverse the vessel in a generally horizontal circular path centered on the axis of the container and a cylinder positioned within the container having an axis of generation substantially congruent with the axis of the vessel and having an outer periphery which is in spaced relation to the inner periphery of the vessel providing an inner and outer cooling surface between the pump and the inner wall of the vessel, whereby the pump produces a circulation of carbon dioxide impregnated water along both the inside and outside cooling surfaces with the circulation velocity of the water along the inside cooling surface being greater than along the outside cooling surface.

4,530,804

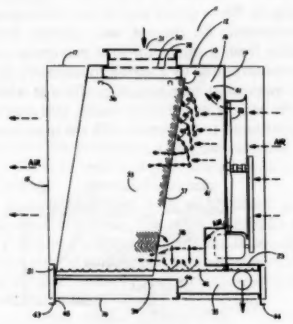
FORCED DRAFT CROSS FLOW, FREE-PLENUM EVAPORATIVE HEAT EXCHANGER

Robert E. Cates, Arnold; Richard H. Harrison, Jr., Columbia, and Thomas P. Carter, Laurel, all of Md., assignors to Baltimore Aircoil Company, Inc., Jessup, Md.

Filed Jan. 22, 1981, Ser. No. 227,574

Int. Cl.[3] B01F 3/04

U.S. Cl. 261—30 7 Claims



1. A forced draft evaporative heat exchanger comprising, in combination, a housing having a base, sidewalls, fan wall, endwall and a topwall so as to define therein an interior chamber; an opening in the fan wall having mounted therein a fan connected to a drive means; at least one opening in the endwall or top wall for the egress of air from the interior chamber of said housing; a heat exchange means having a first edge facing the top wall and a second edge facing the fan wall mounted in the interior chamber extending substantially from the topwall to the base and from one sidewall to the other; means for distributing liquid over the top edges of said heat exchange means; and means for collecting liquid after it has passed down said heat exchange means; said second edge of said heat exchange means having a slope from the vertical such that any point on said edge is no closer to the fan wall than any other point on said edge above said point; and said second edge of said heat exchange means being in spaced relation to the fan wall so as to provide a plenum air zone defined therebetween, whereby liquid can be freely directed to drop from said second edge of said heat exchange means into said plenum, said fan forcing ambient air into the interior chamber of said housing directly against said second edge and being below said first edge of said exchange means.

4,530,805

FLOW REGULATING CARBURETORS

Harold G. Abbey, 11 Goldsmith Dr., Holmdel, N.J. 07733

Continuation of Ser. No. 379,431, May 18, 1982, abandoned, which is a continuation-in-part of Ser. No. 307,956, Oct. 20, 1981, Pat. No. 4,387,685, which is a continuation-in-part of Ser. No. 214,626, Dec. 10, 1980, Pat. No. 4,308,835. This application May 4, 1984, Ser. No. 607,163

Int. Cl.[3] F02M 9/08

U.S. Cl. 261—53 5 Claims

1. A flow regulating carburetor interposable between the combustion air input and the intake of an internal combustion engine which in operation has an air flow proportional to the speed and load of the engine, the air flow giving rise to a proportional fuel flow, said carburetor comprising:

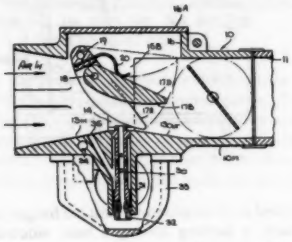
A. a casing having an upstream section coupled to said air input, a downstream section coupled to said engine intake and a throat intermediate said sections whereby incoming air flows through said throat into said engine intake;

B. means communicating with said throat to supply fuel

thereto, which fuel is induced therein by the air flowing through the throat to an extent determined by the differential velocity-pressure developed between the air input and the throat to provide a fuel-air mixture to said engine intake;

C. a throttle interposed between said downstream section and said intake to vary the volume of said mixture fed into the intake; and

D. A swingable, aerodynamic control element pivotally supported in said casing at a position therein at which the incoming air flows above and below the element to effect an aerodynamic lift thereof, said control element being swingable from a minimum to a maximum position and being counterpoised by a spring to normally maintain said control element at its minimum position at which the area at the throat is at its minimum value, said control element being contoured to cooperate with the inner surface of the



casing to shape said upstream section so that it converges toward the throat and to shape the downstream section so that it diverges from the throat to form a venturi passage within the casing, said control element being subjected to the aerodynamic force of the air flowing through the casing which acts to swing the control element toward its maximum position at which the area of the throat is at its maximum value, the force imposed in said element being counterpoised by the spring to produce a differential velocity pressure at the throat that depends on the difference between the prevailing pressure at the air input and at the throat and is proportional to the mass-volume of the air flow to cause the amount of fuel induced into the throat to be proportional to said air flow and thereby give rise to a ratio of fuel to air at the engine intake that represents the optimum ratio for the prevailing condition of engine speed and load throughout a broad engine operating range.

4,530,806

PROCESS OF MAKING ARTICLES OF FOAMED POLYMETHYL METHACRYLATE

Bernd Melchior, Burger Strasse 255, D 5630 Remscheid, Fed. Rep. of Germany, assignor to August Hohnholz KG, Hamburg; Imchemie Kunststoff GmbH, Wermelskirchen and Bernd Melchior, Remscheid, all of, Fed. Rep. of Germany

Filed Jun. 8, 1982, Ser. No. 386,337

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1981, 3124980

Int. Cl.³ B29D *27/04*

U.S. Cl. 264—22 **16 Claims**

1. A process of making articles of foamed polymethyl methacrylate comprising

(1) mixing

(a) 100 parts by weight of monomeric methyl methacrylate;

(b) 5 to 40 parts by weight of a plasticizer which is a monomeric alkyl methacrylate in which the alkyl group comprises at least 3 carbon atoms;

(c) 10 to 100 parts by weight of a foaming agent that will neither evaporate nor decompose at the polymerization temperature and which is a liquid inert foaming agent boiling at a temperature of less than 100° C.; and

(d) at least one polymerization catalyst;

at a temperature below the evaporation or decomposition temperature of the foaming agent to form a mixture and polymerizing said mixture at a pressure in excess of the evaporation pressure of the foaming agent at the polymerization temperature to form a solid body containing said foaming agent, and

(2) positioning said foaming agent-containing solid body on a non-adherent substrate and heating said solid body to a temperature in excess of the evaporation temperature of the foaming agent and in excess of the softening temperature of the polymer to foam said solid body and form a transparent foamed polymethyl methacrylate with closed cells having a diameter of about 5 mm. and a density of about 0.03 to 0.05 g/cm³.

4,530,807

PRODUCTION OF POLYMERIC FOAM

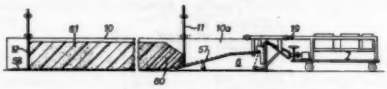
Nicholas C. Vreenegoor, Bennebroek, Near Hillegom, Netherlands, assignor to Unifoam AG, Glarus, Switzerland

Filed May 15, 1984, Ser. No. 610,494

Claims priority, application United Kingdom, May 20, 1983, 8314010

Int. Cl.³ B29D *27/04*

U.S. Cl. 264—51 **13 Claims**



1. A method of producing polymeric foam in a longitudinally-extending channel-shaped mould, comprising the steps of continuously supplying a mixture of liquid foam reactants to the bottom of a vessel, allowing the mixture to expand upwardly in said vessel due to chemical reaction between said reactants, prior to completion of expansion of the mixture allowing partially-expanded foam to flow from said vessel over a weir structure and down a fall plate so that foam is deposited in said mould; characterised by maintaining said mould stationary, mounting said vessel and fall plate transportably within the mould so that the fall plate extends downwardly to the bottom of the mould, and progressively transporting said vessel and fall plate from one end of the mould to the other end of the mould; thereby to progressively lay down partially expanded foam over the bottom of the mould.

4,530,808

BINDER REMOVAL FROM THERMOPLASTICALLY FORMED SIC ARTICLE

Gary M. Renlund, Scotia, and Curtis A. Johnson, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 11, 1984, Ser. No. 599,032

Int. Cl.³ C04B *35/36, 35/64*

U.S. Cl. 264—63 **14 Claims**

1. In the process of producing a sintered body of polycrystalline silicon carbide having a density greater than 80% of the theoretical density for silicon carbide wherein a thermoplastically molded body of sinterable silicon carbide powder and thermoplastic binder is formed, baked to remove said binder and sintered to produce said sintered body, the improvement comprising embedding said molded body in spherical or nominally spherical embedding particles selected from the group consisting of polycrystalline silicon carbide having a density greater than 80% of the theoretical density for silicon carbide, crystalline and/or amorphous free carbon-coated polycrystalline silicon carbide wherein the free carbon has a density

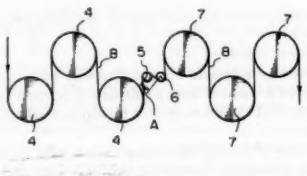
greater than 80% of the theoretical density of graphite and wherein the polycrystalline silicon carbide has a density greater than 80% of the theoretical density for silicon carbide, crystalline and/or amorphous free carbon having a density greater than 80% of the theoretical density of graphite and mixtures thereof, said embedding particles having an average diameter ranging from about 10 microns to about 1000 microns, and baking said embedded body to thermally remove said binder leaving no amount thereof which would have a significantly deleteriously effect on said sintered body and recovering said baked body.

4,530,809

PROCESS FOR MAKING MICROPOROUS POLYETHYLENE HOLLOW FIBERS

Mizuo Shindo; Takashi Yamamoto; Osamu Fukunaga, and Hisayoshi Yamamori, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Division of Ser. No. 281,103, Jul. 7, 1981, Pat. No. 4,401,567. This application Mar. 10, 1983, Ser. No. 474,013
Claims priority, application Japan, Oct. 14, 1980, 55-143155
Int. Cl.³ B29D *7/24*
U.S. Cl. 264—210.7 **5 Claims**



1. A process for preparing microporous polyethylene hollow fibers having:

(a) rectangular pores formed by microfibrils that are oriented in the lengthwise direction of the fiber and knotted portions that are connected to said microfibrils substantially at right angles thereto, the pores being contiguous with each other from the inner wall surface to the outer wall surface to form a stacked, multicellular structure;

(b) a porosity of about 30 to about 90% by volume;

(c) a water permeability through the wall of at least about 65 ($ml/m^2.hr.mmHg$); and

(d) a human serum albumin peremeability of at least about 30% as measured in a physiological saline solution,

said process comprising

(1) melt-extruding a high-density polyethylene having a melt index of 1 to 15 and a density of at least 0.960 in a hollow fiber-producing nozzle, the melt extrusion conducted at a temperature ranging from 135° C. to 215° C.;

(2) taking up the fiber at a spinning draw ratio of about 100 to about 10,000;

(3) annealing the fiber at a temperature above room temperature but below 130° C.;

(4) cold-stretching the thus obtained highly oriented crystallized unstretched hollow fiber at a stretching ratio of about 5 to 100% at a temperature below about 40° C.; and

(5) hot-stretching the hollow fiber through at least one stage at a temperature in the range of 40° C. to 130° C., the total stretching ratio, inclusive of both the cold-stretching and the hot-stretching, being from about 100 to about 900%.

4,530,810

METHOD FOR PRODUCING A WIG BASE

Nobuo Nemoto, Chofu, Japan, assignor to Aderans Co., Ltd., Tokyo, Japan

Division of Ser. No. 295,979, Aug. 25, 1981, Pat. No. 4,422,230, which is a continuation of Ser. No. 123,231, Feb. 21, 1980, abandoned. This application Nov. 8, 1983, Ser. No. 550,071
Claims priority, application Japan, Feb. 28, 1979, 54-021924; Feb. 28, 1979, 54-021925
Int. Cl.³ B29C *1/02*
U.S. Cl. 264—222 **3 Claims**

1. In a method for producing a wig base fitted to the head of the person who is to wear a wig produced from said base, the steps comprising:

holding a semitranslucent sheet of trans-1,4 -polyisoprene having a melting point of about 67° C. and a thickness of about 2 mm in a perimetral clamping frame while heating the sheet until it softens and turns transparent;

allowing the sheet to cool to a temperature at which it can be touched by a human hand;

pressing the sheet against the top of the head of the person who is to wear the wig sufficient to cause said head to bulge the central portion of said sheet to the shape of the top of said head and maintaining said bulge by holding the clamping frame by hand until the sheet is cooled sufficient to turn semitranslucent again;

then removing the sheet from the head and marking a line on said bulge to indicate the portion thereof desired for a wig base;

preparing a mixture of plaster with water;

inverting said sheet and coating a small part of the paste thinly on the inside of said bulge and then pouring the rest into the bulge;

placing one end of a stick at a central portion of the poured paste in the bulge;

removing the plaster from the bulge just before it reaches an exothermic maximum temperature and leaving the plaster a time to complete aggregation and drying said plaster to obain a plaster male mold;

fitting the other end of the stick to the upper end of a stand to tiltably support the male mold on a work table or the like;

spraying a fluorine plastic of low temperature baking type onto the plaster male mold and drying and heating same;

repetitively coating the plaster mold thinly with a solution of polyurethane resin pellets dissolved by DMF and drying same;

heat treating the coating at an elevated temperature, leaving same for a period of time to harden it completely and thereafter removing same from the male mold to obtain the wig base.

4,530,811

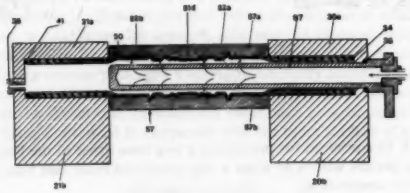
PROCESS FOR THE MANUFACTURE OF A BLANK FOR A CONTAINER

Kjell M. Jakobsen, Skanör, and Claes T. Nilsson, Loddeköpinge, both of Sweden, assignors to PLM Aktiebolag, Malmo, Sweden

Division of Ser. No. 154,887, May 30, 1980, Pat. No. 4,374,878. This application Dec. 23, 1982, Ser. No. 452,628
Claims priority, application Sweden, Jun. 11, 1979, 7905045
The portion of the term of this patent subsequent to Apr. 19, 2000, has been disclaimed.
Int. Cl.³ B29C *17/07, 17/00*
U.S. Cl. 264—521 **14 Claims**

1. A method of producing a tubular pre-molding of a thermoplastic material, the pre-molding comprising a mouth part

with adjacent neck section at one end and a tubular section continuing from the neck section, said method comprising providing a tubular blank consisting mainly of orientable material, orienting the mouth part and adjacent neck section of the blank to form said pre-molding by reducing the thickness of the material while retaining the original thickness of the remainder of the blank such that at least said mouth part has a lower degree of orientation in the circumferential direction as



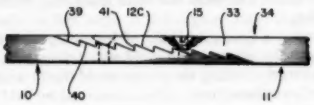
compared to the axial direction, and providing an increased glass transition temperature Tg in said mouth part and adjacent neck section by the reduction of the thickness and the orientation of the mouth part and adjacent neck section such that the increased glass transition temperature Tg in said mouth part and neck section is substantially equal to the glass transition temperature of said tubular section when orientable material of the tubular section is oriented by a subsequent blowing of the pre-molding to a container.

4,530,812

COMPOSITE COILS FOR TOROIDAL FIELD COILS AND METHOD OF USING SAME

Roger G. Perkins, Encinitas, and Stephen M. Trujillo, La Jolla, both of Calif., assignors to FDX Patents Holding Company, N.V., Curacao, Netherlands Antilles

Filed Jan. 15, 1982, Ser. No. 340,237
Int. Cl.³ G21B *1/00*
U.S. Cl. 376—142 **42 Claims**



36. A method of forming a composite field coil winding for a fusion reactor comprising:

providing a first circumferential coil segment made of a first electrically conductive material operable to conduct a first current density and having a first strength operable to support a first load;

providing a second circumferential coil segment made of a second electrically conductive material operable to support a second current density lower than said first current density and having a second strength operable to support a load lower than said first load and having a relatively low neutron absorption cross section whereby neutrons can pass through said second circumferential coil segment more freely than through first circumferential coil segment; and

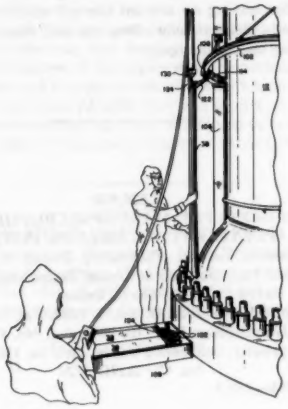
joining said first and second circumferential coil segments at an electrically conductive joint having a strength at least equal to said second strength to form a toroidal field coil winding.

4,530,813

MODULAR REACTOR HEAD SHIELDING SYSTEM

Earl B. Jacobson, 510 S. Shore Dr., Crystal Lake, Ill. 60014

Continuation-in-part of Ser. No. 207,183, Nov. 10, 1980, Pat. No. 4,432,932. This application Oct. 18, 1982, Ser. No. 435,061
Int. Cl.³ G21F *3/00, 5/00*
U.S. Cl. 376—287 **18 Claims**



1. An improved radiation source shielding system comprising:

a radiation source;

substantially elongate support means, said support means secured around at least a substantial portion of the periphery of said radiation source to support said shielding system;

a plurality of flexible shielding means, said shielding means being arranged around the periphery of said source and secured to said support means for substantially reducing radiation exposure;

assembly means for removably securing said shielding means to said support means, said assembly means being adapted to allow bidirectional movement of said shielding means along said support means for quick and easy access to any point on said source;

said assembly means including means for facilitating the mounting and demounting of said flexible shielding means on said support means for substantially decreasing radiation exposure during the mounting and demounting process; and

said facilitating means including hanging assemblies, each of said hanging assemblies being secured to one end of at least one of said shielding means, said hanging assemblies including a hanging member, said hanging member having a first plane and being secured to said shielding means for mounting said shielding means on said support means and a section rigidly secured to said hanging member at an angle thereto, transverse to said plane of said hanging member, said section including engagement means for facilitating lifting of said shielding means, said engagement means substantially centered and offset and extending away from said hanging member plane.

4,530,814

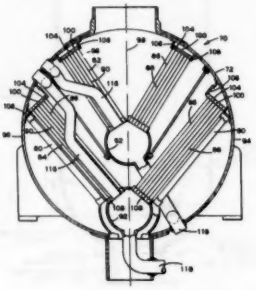
APPARATUS FOR SUPERHEATING STEAM

Donald C. Schluderberg, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed May 13, 1982, Ser. No. 377,721
Int. Cl.³ G21C *15/16*; G21D *5/16*
U.S. Cl. 376—317 **13 Claims**

1. In a nuclear power plant including a steam turbine and a

nuclear steam generator from which steam is discharged for driving the turbine, heat exchange apparatus having a generally cylindrical elongate shell extending horizontally between a pair of ends, inlet means for receiving the steam, outlet means for discharging the steam to the turbine, and means including at least one bundle of inclined tubes positioned in the flow path of the steam through the heat exchange apparatus and each of which has a length which is less than the shell diameter for providing a flow of vapor for transferring heat to the steam and for condensing the vapor in said tubes without sub-cooling



it, each of said tubes opens into and extends in an upwardly direction from a header and lies in a vertical plane which is perpendicular to the vertical longitudinal centerplane of the shell, said header lies in said centerplane, said tube bundle comprises two banks of said tubes, and the angle at which each of the tubes of one of said banks extends relative to said centerplane is opposed to the angle at which each of the tubes of the other of said banks extends relative to said centerplane; and a fossil fuel-fired vapor generator for receiving condensate from said heat exchange apparatus, heating the condensate to generate vapor, and discharging the vapor to said tubes.

4,530,815

METHOD OF PRODUCING A CONTACT DEVICE FOR A SWITCH

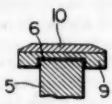
Kouichi Inagaki, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jun. 27, 1983, Ser. No. 508,160

Claims priority, application Japan, Jun. 29, 1982, 57-114259; Dec. 1, 1982, 57-212410

Int. Cl.³ B22F *7/04, 3/16*

U.S. Cl. 419—8 **6 Claims**



1. A method of producing a contact device for a switch comprising the steps of:

placing a powdered alloy contact material directly on a main surface and concentrically of a pre-existing disc-shaped substrate pedestal of electrically conductive solid copper or copper alloy metal material and pressing said material and substrate pedestal to form a unitarily molded product;

sintering said molded product at an elevated temperature no higher than about 1,060 degrees C. to solidify said powdered alloy contact material and to obtain a complete bonding state between said alloy contact material and said substrate pedestal material;

machining the sintered product to a desired shape; and

brazing an electrode bar to said substrate pedestal.

4,530,816

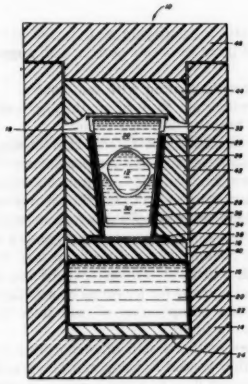
METHOD AND DEVICE FOR COOLING, PRESERVING AND SAFELY TRANSPORTING BIOLOGICAL MATERIAL

Diarmaid H. Douglas-Hamilton, Beverly, Mass., assignor to Hamilton Farm, South Hamilton, Mass.

Filed Jun. 15, 1983, Ser. No. 504,578

Int. Cl.³ F25D *3/08*

U.S. Cl. 422—1 **20 Claims**



16. A device for cooling, preserving and transporting a specimen selected from the group consisting of equine semen and equine embryos, comprising:

means containing a specimen selected from the group consisting of equine semen and equine embryos, including a substantially isothermal wall,

means for cooling said specimen containing means, including means for containing ice,

thermally insulating barrier means substantially completely interposed between said specimen containing means and said cooling means, for controlling a continuous rate of cooling of said specimen by said cooling means, and

a thermally insulating support container for containing, and thermally insulating from ambient temperature, said specimen containing means, said cooling means and said thermally insulating barrier means,

said thermally insulating barrier means and said thermally insulating support container defining thermal constants selected so that said cooling rate is approximately one to three minutes per degree Centigrade and so that said specimen is maintained, after cooling, at a temperature in the range of approximately 4° C. to 10° C.

4,530,817

APPARATUS FOR THE PROTECTION OF AIR FED TO A LABOR-PROTECTION OR VEHICLE COMPARTMENT

Heinz Hölter, Beisenstrasse 39-41, D-4390 Gladbeck; Heinrich Igelbüscher, Gladbeck; Heinrich Gresch, Dortmund-Wickede, and Heribert Dewert, Gladbeck, all of Fed. Rep. of Germany, assignors to Heinz Hölter, Gladbeck, Fed. Rep. of Germany

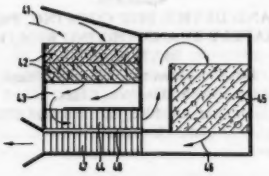
PCT No. PCT/EP80/00156, § 371 Date Sep. 2, 1981, § 102(e) Date Sep. 2, 1981, PCT Pub. No. WO81/01963, PCT Pub. Date Jul. 23, 1981

Continuation of Ser. No. 302,424, Sep. 2, 1981, abandoned. This PCT application Dec. 31, 1980, Ser. No. 600,195

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1980, 3000078; Jan. 15, 1980, 3001210; Jan. 16, 1980, 3001336; Jan. 16, 1980, 3001393; Feb. 8, 1980, 3004675; Feb. 20, 1980, 3006323; May 16, 1980, 3018695; Jul. 26, 1980, 3028433

Int. Cl.³ B01D *53/36*

U.S. Cl. 422—122 4 Claims



1. An apparatus for purifying air to be fed to a cabin adapted to be occupied by at least one person, said apparatus comprising:

a housing communicating with said cabin;

means for inducing a flow of air through said housing and from said housing into said cabin;

a multilayer chemisorption filter in said housing traversed by said flow and operable at a temperature in excess of ambient temperature to absorb components of said flow;

a partial heater upstream of said chemisorption filter in said housing for heating the flow before it enters said chemisorption filter to a temperature preventing moisture take-up by said chemisorption filter from said flow;

a catalytic filter disposed downstream of said chemisorption filter in said housing for traversal by said flow for catalytically reacting components of said flow traversing said chemisorption filter;

a main heater between said chemisorption filter and said catalytic filter in said housing and traversed by said flow for heating said flow to a temperature in which the water vapor pressure of the flow entering said multilayer filter exceeds the moisture pick-up temperature of said catalytic filter; and

a cooler in said housing downstream of said catalytic filter for cooling the flow before it enters said cabin at a temperature suitable for said person in said cabin.

4,530,818

TRANSPARENT FUSED SILICA BELL FOR PURPOSES RELATING TO SEMICONDUCTOR TECHNOLOGY

Alfons Gutermann, Freigericht; Heinz Herzog, Karlstein; Heinrich Mohn, Gelnhausen, and Karl A. Schülke, Neuberg, all of Fed. Rep. of Germany, assignors to Heraeus Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany

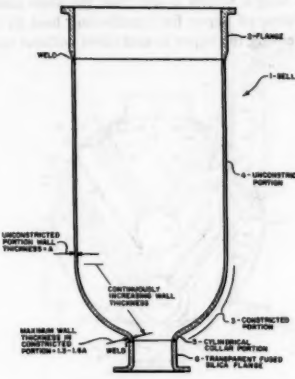
Continuation of Ser. No. 123,323, Feb. 21, 1980, abandoned. This application Feb. 4, 1982, Ser. No. 345,513

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1979, 2908288

Int. Cl.³ C30B *25/08*

U.S. Cl. 422—240 3 Claims

1. A bell of transparent fused silica for purposes relating to semi-conductor technology, especially an epitaxy bell, consisting essentially of a bell wall, said bell wall having an unconstricted portion and a constricted end portion, said constricted end portion welded to a flange of transparent fused silica, said flange consisting essentially of a thick walled tubular piece of transparent fused silica, one end of which is welded to said constricted end portion, said constricted end portion having a thickness greater than the thickness of the unconstricted portion of said bell wall but no more than twice the thickness of



the unconstricted portion, the wall thickness of said constricted end portion continuously increasing towards said thick walled tubular piece, said bell having means for maintaining a process gas flow through said bell from said unconstricted portion out via said constricted end portion of said flange consisting essentially of said thick walled tubular piece of transparent fused silica.

4,530,819

PROCESS FOR REDUCING THE IRON

Béla Czeglédi; Mihály Csövári; Miklós Erdélyi; József Illi; Lajos Stocker; Attila Szöke, all of Pécs; Katalin Szabó née Mogyorósi, Tatabánya; Szilárd Riederauer, Budapest; Miklós Ürmössy, Budapest; Gyula Térényi, Budapest, and István Csurgai, Budapest, all of Hungary, assignors to Tatabányai Szénbányák, Tatabánya and Mecseki Ercbányászati Vállalat, Pécs, both of, Hungary

Continuation of Ser. No. 295,241, Aug. 21, 1981,. This application Sep. 28, 1983, Ser. No. 536,232

Claims priority, application Hungary, Aug. 26, 1980, 2109/80

Int. Cl.³ C01F *7/22, 7/26*

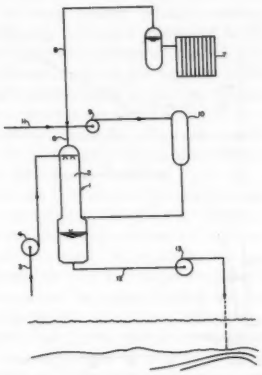
U.S. Cl. 423—112 3 Claims

1. In a process for reducing the iron content of iron- silicon- and aluminum-containing raw materials and for producing ferric oxide, along with an alumina concentrate, by treating the starting materials with hydrochloric acid or with hydrochloric acid and chlorine gas, deironizing the ferric chloride containing solution with an ion exchange resin, eluting ferric chloride from the ion exchange resin, subjecting the ferric chloride to pyrrolytic decomposition, treating the residue of reduced iron content with sulfuric acid, heating to produce aluminum sulfate, and subsequently treating with water to eliminate silica, subjecting aluminum sulfate to pyrrolytic decomposition and recycling hydrochloric acid and sulfuric acid in the system, wherein the improvement comprises passing in an upward direction at a rate of 0.2–10 cm./hour in a semi-continuous counter-current flow through one or more beds prepared from the unground raw material an aqueous hydrochloric acid solution of a concentration exceeding 100 g./lit. at room temperature, maintaining the solid to liquid ratio between 1:0.3 and 1:1, and maintaining the required hydrochloric acid concentration of at least about 100 g./lit. by absorbing at least a part of the hydrochloric acid gas formed during the decomposition of the chlorides formed in the ferric oxide containing solution.

4,530,820
DEAERATION OF WATER

Norolf Henriksen, Notodden, Norway, assignor to Norsk Hydro a.s., Oslo, Norway

Filed Aug. 26, 1983, Ser. No. 526,879
Claims priority, application Norway, Sep. 13, 1982, 823090
Int. Cl.³ B01D *19/00*
U.S. Cl. 423—219 7 Claims



1. In a process for deoxidizing water by intimately mixing an inert gas with said water, whereby said inert gas removes oxygen from said water, and separating the thus deoxidized water and said inert gas thus enriched with oxygen, the improvement comprising:

mixing hydrogen gas with said oxygen enriched inert gas;

passing the resultant gas mixture into a catalytic reaction zone and therein catalytically reacting said hydrogen and oxygen at atmospheric pressure to form water;

removing the thus purified inert gas and said water from said catalytic reaction zone and directly mixing said purified inert gas and said water with additional water to be deoxidized; and

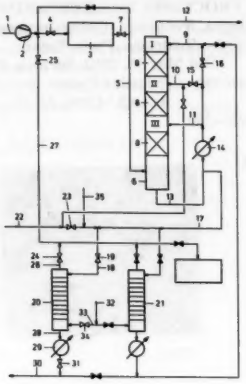
conducting the entire said process without additional drying, cooling, purification or rectification of the inert gas.

4,530,821
BRIDGING OPERATIONAL SHUT-DOWNS OF THE AMMONIA WASHER OF A PLANT OPERATING ACCORDING TO THE SEMI-DIRECT TECHNIQUE FOR THE REMOVAL OF AMMONIA FROM COKING OVEN GAS

Peter Diemer, Essen, Fed. Rep. of Germany, assignor to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Sep. 12, 1983, Ser. No. 531,595
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1982, 3243188
Int. Cl.³ B01D *53/34*
U.S. Cl. 423—238 7 Claims

1. In the removal of ammonia from coking oven gas by means of an ammonia washer of a plant operating according to the semi-direct technique, of the type wherein the coking oven gas, in connection with the ammonia washer, is subjected to a direct secondary cooling and the ammonia contained in the process waters is freed by means of driving-off with water vapor under the addition of alkali, a process for bridging operational standstills of said ammonia washer comprising washing out said ammonia in a secondary cooler during said operational standstills of said ammonia washer, an upper part, Wash-Stage I, of said secondary cooler being provided with stripped water from an ammonia still, a middle part, Wash Stage II, of said secondary cooler being provided with gas water and a lower

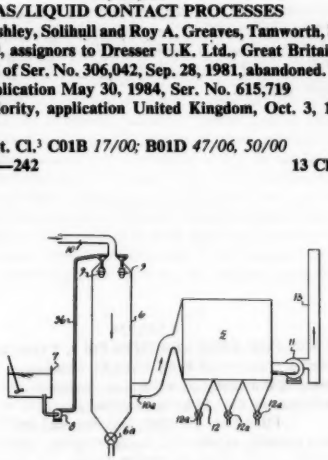


part, Wash Stage III, of said secondary cooler being provided with cooled circulation water.

4,530,822
GAS/LIQUID CONTACT PROCESSES

Michael J. Ashley, Solihull and Roy A. Greaves, Tamworth, both of England, assignors to Dresser U.K. Ltd., Great Britain

Continuation of Ser. No. 306,042, Sep. 28, 1981, abandoned. This application May 30, 1984, Ser. No. 615,719
Claims priority, application United Kingdom, Oct. 3, 1980, 8031942
Int. Cl.³ C01B *17/00;* B01D *47/06, 50/00*
U.S. Cl. 423—242 13 Claims



1. In a method of treating a gaseous-pollutant-containing gas with an abrasive aqueous liquid which absorbs the pollutant to clean the gas while evaporating the liquid: the improvement comprising the steps of

(a) continuously flowing a film of the liquid onto a rotating extended cup-like surface of a spray device in a direction toward a distal end portion of said cup-like surface preparatory to directing the liquid from the surface into the gas; and

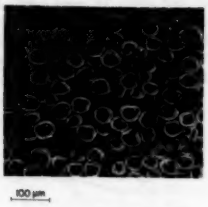
(b) impacting the liquid in its direction of flow near and beyond the distal end portion of said cup-like surface with a pressurized gaseous stream thereby to produce a spray of liquid droplets for contacting with the polluted gas.

4,530,823

URANIUM PEROXIDE IN THE FORM OF SPHERICAL PARTICLES HAVING GOOD FLOWABILITY AND PROCESSES FOR PREPARING SAME

Jacques Dugua, Vernaison, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed May 18, 1982, Ser. No. 379,336
Claims priority, application France, Jun. 19, 1981, 81 12081
Int. Cl.³ C01G 43/00
U.S. Cl. 423—260 6 Claims



1. A process for the preparation of uranium peroxide which comprises establishing a fluidized bed in a zone containing a supersaturated uranium peroxide mother liquor solution containing fine uranium peroxide crystals obtained by reaction of a solution selected from the group consisting of uranyl sulfate and uranyl nitrate solutions having a concentration of uranium of from about 0.5 to about 300 g/L and a solution of hydrogen peroxide having a concentration of from about 5 to about 70% by weight, wherein the crystals are maintained in a solid/liquid fluidized state by the continuous upward movement of the supersaturated solution, precipitating uranium peroxide at a pH of from about 2.5 to about 4 and at a temperature of from about 0° to about 60° C., and withdrawing uranium peroxide particles so formed as substantially spherical grains with a mean diameter of from about 30 to about 130 microns from the fluidized bed.

4,530,824

PROCESS FOR PREPARATION OF L TYPE ZEOLITES

Junji Arika, Tokuyama; Keiji Itabashi, Shinnanyo, and Yoshio Tamura, Tokuyama, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Oct. 18, 1983, Ser. No. 543,007
Claims priority, application Japan, Oct. 18, 1982, 57-181408
Int. Cl.³ C01B 33/28
U.S. Cl. 423—328 5 Claims

1. A process for the preparation of L type zeolites, which comprises crystallizing an amorphous sodium aluminosilicate compound containing a silicon component in an amount of 67 to 91% by weight as SiO_2 on the anhydrous basis in an aqueous potassium hydroxide solution,

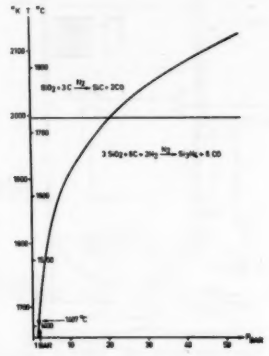
said amorphous sodium aluminosilicate compound having a particle size of 1 to 500 microns and being obtained by reacting an aqueous sodium silicate solution with an aqueous aluminum-containing solution while both the aqueous solutions are simultaneously and continuously supplied to a reaction vessel and the pH value of the reaction product is maintained in the range of from 5 to 9.

4,530,825

PROCESS FOR THE PRODUCTION OF SILICON NITRIDE

Thomas Johansson, Ljungaverk, Sweden, assignor to KemaNord AB, Stockholm, Sweden

Filed Apr. 12, 1984, Ser. No. 599,702
Claims priority, application Sweden, Apr. 19, 1983, 8302207
Int. Cl.³ C01B 21/068
U.S. Cl. 423—344 11 Claims



1. A process for the production of silicon nitride by reaction of silicon dioxide, carbon and nitrogen under heat supply in an endothermic process at temperatures in the raw material mixture above 1300 degrees centigrade, comprising the steps of maintaining a nitrogen partial pressure above 5 bars during the reaction.

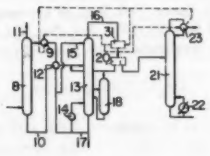
10. A process for the production of silicon nitride comprising reacting a mixture consisting of silicon dioxide and carbon at temperatures above 1407 degrees C. with nitrogen at a partial pressure above atmospheric pressure to yield a solid product consisting essentially of silicon nitride.

4,530,826

METHOD FOR RECOVERING AND UTILIZING WASTE HEAT

Hiroyuki Ohashi, Yokohama; Shoichi Miyamoto, Machida, and Shigeru Kurihara, Kawasaki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 326,780, Dec. 2, 1981, abandoned. This application Aug. 29, 1983, Ser. No. 527,449
Claims priority, application Japan, Dec. 3, 1980, 55-170492; Dec. 3, 1980, 55-170494; Jul. 9, 1981, 56-107515
Int. Cl.³ C07C 120/14, 121/32, 51/16; C01C 3/04
U.S. Cl. 423—376 14 Claims



1. A method for recovering and utilizing waste heat in the production of an unsaturated nitrile by cooling with water in a quenching column a reaction mixture comprising an unsaturated nitrile, a saturated nitrile and hydrogen cyanide formed by the ammoxidation reaction of an olefin, absorbing reaction mixture into an absorption water in an absorption column, subjecting the resulting absorption solution to an extractive

distillation by the use of solvent water in a recovery column, thereby obtaining a distillate comprising the unsaturated nitrile and hydrogen cyanide from the top of the column, and removing by distillation the hydrogen cyanide and water from the distillate in distillation columns in a de-hydrogen cyanide column, a dehydration column, a product column wherein the solvent water withdrawn from the side part of the stripping column and freed substantially from the fraction comprising the unsaturated nitrile and hydrogen cyanide contained in the feed to the recovery column without passing through an acetonitrile-stripping column is circulated as the absorption water in the absorption column or the solvent water withdrawn from the lower part of the recovery column and freed from acetonitrile substantially by passing through an acetonitrile stripping column is circulated as the solvent water in the recovery column and/or as the absoprtion water in the absorption column, characterized in that an absorption refrigerator or an absorption heat pump is driven by using, as its driving source, at least one heat source at a temperature of not more than 100° C. selected from the group consisting of the circulating water in the quenching column, the solvent water circulated as the solvent water in the absorption solumn and the recovery column, the vapor distilled out from the top of the recovery column and the vapor distilled out from the top of the dehydration column, to obtain a refrigerant or hot water having a temperature higher than the temperature of the heat source, and said refrigerant is used for cooling at least one member selected from the group consisting of the absorption water in the absorption column, the overhead vapor of the de-hydrogen cyanide column and the unsaturated nitrile withdrawn from the product column and/or hot water is used as at least one heat source selected from those of the distillation columns of the de-hydrogen cyanide column, the dehydration column, and the product column.

11. A method for recovering and utilizing waste heat in the production of hydrogen cyanide by the ammoxidation of methane comprising feeding methane, ammonia and air to a reactor in the presence of a catalyst to yield a gaseous mixtute comprising mainly hydrogen cyanide and further containing unreacted ammonia, passing the gaseous mixture through a waste heat boiler, passing the mixture from the boiler to an ammonia-absorption column, circulating an aqueous solution of sulfuric acid through the top of an ammonia-adsorption column so as to flow down the ammonia-adsorption and cool the gas and simultaneously convert the unreacted ammonia to ammonium sulfate, said sulfuric acid solution at a temperature of not more than 100° C. passing from the bottom of the ammonia-adsorption column through an adsorption refrigerator and circulating back to the ammonia-adsorption column so as to produce a refrigerant, discharging the ammonium sulfate from the bottom of the ammonia-adsorption column, directing the gas from which ammonia had been removed in the ammonia-adsorption column to a cooling column wherein the gas is cooled while in contact with circulating cooling water flowing down from the top of the cooling column, directing cooled gas from the cooling column to an adsorption column wherein low temperature absorbing water enters the top of the adsorption column and flows down the adsorption column, directing an absorption solution from the bottom of the adsorption column to a rectifying column, subjecting the hydrogen cyanide distilled out of the top of the rectifying column to partial condensation in a partial condenser to separate water, directing the hydrogen cyanide from the partial condenser to a condenser to condense the hydrogen cyanide, passing the condensed hydrogen cyanide to a tank, directing a bottom stream from the rectifying column to a heat exchanger to preheat the absorption solution, and utilizing said refrigerant produced in the refrigerator in at least one member of the group consisting of the cooler in the adsorption column, the partial condenser the condenser and the tank.

4,530,827

PROCESS FOR THE SIMULTANEOUS REMOVAL OF H_2S, SO_2 AND ELEMENTAL SULFUR FROM GASEOUS MIXTURES

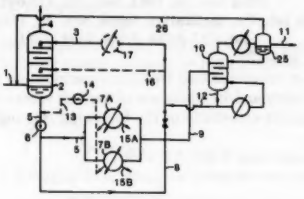
Michael Heisel, Munich, and Gerhard Ranke, Poecking, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Oct. 26, 1983, Ser. No. 545,427

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1982, 3239603

Int. Cl.³ C01B *17/05*

U.S. Cl. 423—575 **22 Claims**



1. In a process for the simultaneous removal of H_2S, SO_2 and elemental sulfur from effluent gases of the type produced by plants operating on the Claus process, which process comprises scrubbing the gas with a solvent to absorb the components to be removed, regnerating the solvent and recycling regenerated solvent for reuse, the improvement comprising: continuously scrubbing the effluent gas countercurrently, with a solvent capable of dissolving H_2S, SO_2 and elemental sulfur and being stable against decomposition by sulfur compounds, said solvent being at a temperature lower than that of said gas, and reacting the absorbed H_2S and SO_2 to form elemental sulfur and H_2O thereby causing said solvent to be heated during said scrubbing; separating a partial stream of resultant loaded of solvent and continuously lowering the temperature thereof by an amount effective to precipitate solid, elemental sulfur therefrom, and continuously separating the elemental sulfur from the solvent to produce a regenerated solvent stream; mixing the remaining stream of heated loaded solvent with the resultant cooled partial stream of regenerated solvent to increase the solubility of elemental sulfur in the cooled regenerated solvent thereby suppressing precipitation of any sulfur in the resultant combined solvent stream; and recycling resultant cooled regenerated solvent, reduced in sulfur content and non-saturated with respect to H_2S and SO_2, into the scrubbing step to again absorb components to be removed and be reheated in countercurrent flow to the hotter gases being treated.

4,530,828

NAIL CONDITIONER

Walter P. Smith, Scudy Hook, and Sergio Nacht, Weston, both of Conn., assignors to Richardson-Vicks Inc., Wilton, Conn.

Filed Sep. 16, 1982, Ser. No. 419,023

Int. Cl.³ A61K *7/04, 31/00, 47/00, 7/06*

U.S. Cl. 424—61 **7 Claims**

1. A composition for the treatment of human nails or cuticles consisting essentially of an aqueous emulsion containing the following ingredients in percent by weight, based on the weight of the total composition:

Hydrolyzed animal protein	0.6–10.0
Urea	0.6–10.0
Sodium lauryl sulfate	0.06–2.5
Mineral oil	2.0–7.8
Cholesterol	0.8–1.2
Lipid	4.5–7.3

wherein said lipid is a member selected from the group consist-

ing of cetyl alcohol, cetyl palmitate, a base salt of a fatty acid and mixtures thereof, said fatty acid being selected from the group consisting of palmitic acid, stearic acid and mixtures thereof, and said base salt being selected from th group consisting of ammonium, alkali metal, alkaline earth metal and alkanolamino.

4,530,829

HAIR TREATMENTS

Yoshiaki Abe, Tokyo, Japan, assignor to Kao Corporation, Tokyo, Japan

Filed Sep. 10, 1982, Ser. No. 416,665
Claims priority, application Japan, Sep. 14, 1981, 56-144992
Int. Cl.³ A61K *7/06, 7/08, 7/11*
U.S. Cl. 424—70 **13 Claims**

1. In an improved hair treatment composition for restoring the flexibility and/or resilience of the hair where the improvement consists essentially of the following two ingredients (A) and (B):

(A) tannic acid 0.001–5.0 wt%

(B) ethylene diamine tetracetic acid: 0.01–5.0 wt%.

4,530,830

QUATERNARY AMMONIUM HYDROXIDE HAIR RELAXER COMPOSITION

William McKaba, and Clyde B. Simpson, both of Jacksonville, Fla., assignors to Revlon, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 374,841, May 2, 1982, abandoned. This application Dec. 16, 1983, Ser. No. 562,268
Int. Cl.³ A61K *7/09, 7/11, 7/06*
U.S. Cl. 424—71 **12 Claims**

1. A hair relaxer composition for straightening hair consisting essentially of by weight:

(a) 2.0–20% of a quaternary ammonium hydroxide selected from the group consisting of benzyltrimethyl ammonium hydroxide, tetraethyl ammonium hydroxide, tetramethyl ammonium hydroxide, tetrabutyl ammonium hydroxide, tetrapropyl ammonium hydroxide, methyl triethanol ammonium hydroxide, benzyl dimethyl ethanol ammonium hydroxide, benzyltriethyl ammonium hydroxide, benzyltributyl ammonium hydroxide, octadecyl trimethyl ammonium hydroxide, tetrahexyl ammonium hydroxide, and tetraoctyl ammonium hydroxide;

(b) 2–20% of an emulsifier selected from the group consisting of polyethylene glycol ether of cetyl alcohol, polyethylene glycol ether of lauryl alcohol, polyethylene glycol ether of nonyl phenol and polyethylene glycol ether of lanolin alcohol;

(c) 2 to 30% of an emollient selected from the group consisting of cetyl alcohol, petrolatum, stearyl alcohol, paraffin, mineral oil, lanolin alcohol and polyethylene glycol ether of octyl phenol; and

(d) water q.s. 100 percent.

4,530,831

INFECTIOUS BURSAL DISEASE VACCINE

Heinrich D. Lütticken, Boxmeer, and Daniël R. W. Cornelissen, Sambeek, both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed Nov. 2, 1982, Ser. No. 438,936
Int. Cl.³ A61K *39/12;* **C12N** *7/00*
U.S. Cl. 424—89 **8 Claims**

1. A live vaccine effective against Infectious Bursal Disease in poultry upon a single administration to birds at usual age of vaccination Infectious Bursal Disease virus belonging to the strain deposited at the ATCC under No. VR-2041.

2. An inactivated vaccine effective against Infectious Bursal Disease in poultry upon a administration to birds at the usual age of vaccination comprising an inactivated Infectious Bursal Disease virus belonging to the deposited in the ATCC under No. VR-2041.

4,530,832

METHOD OF VACCINATION FOR PREVENTION OF *BORDETELLA BRONCHISEPTICA* INFECTION

Robert A. Goodnow; Floyd J. Shade, and Thomas A. Sloboth, all of Omaha, Nebr., assignors to Schering Corporation, Madison, N.J.

Continuation of Ser. No. 162,539, Jun. 24, 1980, abandoned, which is a continuation-in-part of Ser. No. 967,478, Dec. 7, 1978, abandoned. This application Sep. 21, 1981, Ser. No. 304,215
Int. Cl.³ A61K *39/10*
U.S. Cl. 424—92 **8 Claims**

1. A method of obtaining effective implant colonization when subjecting an animal subject to *Bordetella bronchiseptica* infection to intra-respiratory vaccination with a live avirulent strain of *B. bronchiseptica* which has been attenuated to the extent that it is self-clearing from the respiratory mucosa of the animal to be immunized, comprising:

(a) immediately prior to said vaccination combining freeze-dried viable cells of said avirulent self-clearing strain with sterile water containing a wetting agent to form an aqueous suspension of said cells, said suspension containing at least 1×10^6 of said viable cells per milliliter, the amount of said wetting agent in said suspension being selected to be non-inhibitory to the growth of said cells while promoting implantation of said cells in respiratory mucosa; and

(b) administering the resulting wetting agent-containing suspension by applying it to the respiratory mucosa of said animal.

4,530,833

TOXINS AND ANTIBODIES OF *C. DIFFICILE*

Tracy D. Wilkins, 305 Neil St., and Nadine M. Sullivan, 2512 Manchester St., NE., both of Blacksburg, Va. 24060

Filed Sep. 13, 1982, Ser. No. 417,380
Int. Cl.³ A61K *39/08;* **C07G** *7/00*
U.S. Cl. 424—92 **4 Claims**

1. A process of preparing pure toxin A of *C. difficile* comprising:

Adjusting the pH and molarity of an aqueous solution of partially purified toxin A of *C. difficile*, which is substantially free of toxin B and containing some nontoxigenic proteins, whereby the toxin A is precipitated without precipitation of nontoxigenic proteins and without denaturation of the toxin A, said pH being at a value of less than 6.0, said molarity being less than 0.1M;

and recovering the precipitated toxin A as pure toxin A.

4,530,834

PREPARATION OF AN ENTOMOPATHOGENIC FUNGAL INSECT CONTROL AGENT

Dennis McCabe, Madison, Wis., and Richard S. Soper, Ithaca, N.Y., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sep. 17, 1982, Ser. No. 419,637
Int. Cl.³ A01N *63/00;* **C12N** *3/00, 1/00, 1/14*
U.S. Cl. 424—93 **8 Claims**

1. A process for preparing dried mycelia for use as an insect control agent comprising culturing mycelia in a suitable medium, harvesting growing mycelia, treating said mycelia with a chemical protectant to prevent excessive loss of viability during storage, incubating the treated mycelia for about four to five hours at about 22° to 26° C. and about 20 to 40% relative humidity, drying the incubated mycelia at about 4° C. with rapid air circulation for about 18 hours, drying further the partially dried mycelia at ambient room temperature of about 20° to 26° C. with rapid air flow for about four to six hours and then grinding and storing the dried mycelia.

4,530,835
CL-1577 ANTIBIOTIC COMPOUNDS AND THEIR PRODUCTION

Richard H. Bunge; James C. French; Timothy R. Hurley; Tim A. Smitka, all of Ann Arbor, and Josefino B. Tunac, Troy, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jul. 8, 1983, Ser. No. 512,088
Int. Cl.³ A61R *35/74;* C12P *1/06*
U.S. Cl. 424—117 5 Claims

1. A complex of sulfur-containing antibiotic compounds designated CL-1577A or CL-1577B,; compound CL-1577A characterized by:

(a) a molecular weight (FAB mass spectrometry) of 1248 a.m.u.;

(b) an ultraviolet absorption spectrum in methanol solution exhibiting absorption maxima at 215 nm (a=27.4), 252 nm (a=28.2), 282 nm (a=16.7), and 318 nm (a=11.6);

(c) an infrared absorption spectrum (potassium bromide pellet) exhibiting principal absorption peaks at 3450, 2970, 2930, 1690, 1630, 1610, 1600, 1525, 1465, 1450, 1410, 1370, 1310, 1250, 1210, 1155, 1075, 1020, 990, 905, 880, 855, 795, 780, and 750 reciprocal centimeters;

(d) a 200 MHz proton magnetic resonance spectrum ($CDCl_3$) exhibiting signals at 1.11 (doublet), 1.33 (doublet), 1.35 (doublet), 1.41 (doublet), 1.56 (multiplet), 1.95 (doublet), 2.12 (multiplet), 2.13 (singlet), 2.22 (multiplet), 2.30 (multiplet), 2.52 (doublet of doublets), 2.53 (singlet), 2.75 (multiplet), 3.42 (singlet), 3.4–4.2 (multiplet), 3.81 (singlet), 3.89 (singlet), 3.98 (singlet), 4.21 (singlet), 4.57 (doublet), 4.67 (multiplet), 4.97 (doublet), 5.40 (multiplet), 5.49 (doublet), 5.50 (multiplet), 5.70 (doublet), 5.82 (doublet), 6.00 (doublet), 6.15 (broad singlet), 6.26 (singlet), 6.60 (doublet of doublets), 7.49 (singlet), 8.60 (singlet), and 11.71 (singlet) parts per million downfield from tetramethylsilane;

(e) an optical rotation $[\alpha]_D = -198°$ (c 1.25, $CHCl_3$); and

(f) the elemental analysis, 53.26% C, 6.04% H, 3.82% N, and 8.98% S;

compound CL-1577B characterized by:

(a) an ultraviolet absorption spectrum in methanol solution exhibiting absorption maxima at 215 nm (a=26.8), 252 nm (a=26.5), 282 nm (a=16.1), and 325 nm (a=11.9);

(b) an infrared absorption spectrum (potassium bromide pellet) exhibiting principal absorption peaks at 3450, 2970, 2930, 1690, 1630, 1610, 1600, 1525, 1465, 1450, 1410, 1370, 1310, 1250, 1210, 1155, 1075, 1020, 945, 905, 880, 855, 795, 780, and 750 reciprocal centimeters;

(c) a 200 MHz proton magnetic resonance spectrum ($CDCl_3$) exhibiting signals at 1.11 (doublet), 1.12 (doublet), 1.24 (doublet), 1.35 (doublet), 1.41 (doublet), 1.43 (singlet), 1.46 (multiplet), 2.00 (multiplet), 2.13 (singlet), 2.14 (multiplet), 2.31 (multiplet), 2.52 (singlet), 2.53 (multiplet), 2.75 (multiplet), 3.42 (singlet), 3.4–4.2 (multiplet), 3.79 (singlet), 3.89 (singlet), 3.99 (singlet), 4.19 (singlet), 4.49 (multiplet), 4.56 (doublet), 4.66 (doublet), 4.77 (multiplet), 4.97 (doublet), 5.35 (broad singlet), 5.47 (multiplet), 5.72 (doublet), 5.83 (doublet), 5.93 (doublet), 6.21 (multiplet), 6.24 (singlet), 6.59 (doublet of doublets), 7.61 (singlet), 8.64 (singlet), and 11.58 (singlet) parts per million downfield from tetramethylsilane; and

(d) an optical rotation $[\alpha]_D = -189°$ (c 0.63, $CHCl_3$); and

(e) the elemental analysis, 54.81% C, 6.33% H, 3.86% N, 8.96% S.

4,530,836
PEPTIDE

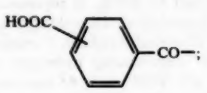
Noboru Yanaihara, Shizuoka; Nobuo Sugiura, Hajima, and Kazuhisa Kashimoto, Kasugai, all of Japan, assignors to Amano Pharmaceutical Co., Ltd., Nagoya, Japan

Filed May 17, 1984, Ser. No. 611,538
Claims priority, application Japan, May 31, 1983, 58/97718; Nov. 4, 1983, 58/208066
Int. Cl.³ A61K *37/00;* C07C *103/52*
U.S. Cl. 514—16 19 Claims

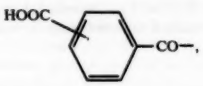
1. Novel peptides represented by the following formula

$$R_1\text{-A-B-C-D-Trp-Met-Y} \quad (1)$$

wherein R_1 denotes pGlu, X—R_2—CO—, X being carboxyl or amino and R_2 being lower alkylene of 1–6 carbon atoms, or



A denotes Asp, Ala, or merely a chemical bond; B denotes Tyr(SO_3H) or Phe($NHSO_3H$); C denotes Met or merely a chemical bond; D denotes Gly, D-Ala, or D-Trp; and Y denotes NH_2, Asp-NH_2, or Asp-Phe-NH_2; with the proviso that Y is NH_2 or Asp-NH_2 when R_1 is pGlu, HOOC—R_2—CO—, or



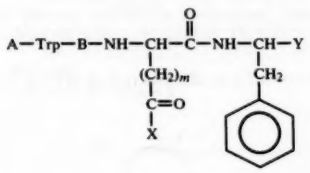
B is Tyr(SO_3H), C is Met, and D is Gly, and pharmacologically acceptable salts thereof.

4,530,837
PEPTIDE DERIVATIVES, THEIR PREPARATION PROCESS AND THEIR PHARMACEUTICAL USE

Marie-Helene Charon, Paris; Pierre Fromageot, Le Chesnay, and Paul P. Van Chuong, Antony, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

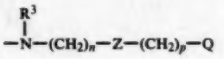
Filed Dec. 15, 1983, Ser. No. 561,785
Claims priority, application France, Dec. 16, 1982, 82 21127
Int. Cl.³ A61K *37/00;* C07C *103/52*
U.S. Cl. 514—18 10 Claims

1. A peptide derivative having the following formula:

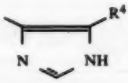


wherein A stands for hydrogen, a radical selected from the group of D or L-pyroglutamyl, L or D-alanyl, β-alanyl, glycyl, L or D-prolyl, L or D-valyl, L or D-phenylalanyl, L or D-homocysteyl, L or D-aspartyl, L or D-glutamyl, L or D-histidyl, L or D-methionyl, L or D-threonyl, L or D-seryl, L or D-cysteyl, L or D-leucyl, L or D-isoleucyl, L or D-arginyl, L or D-tryptophanyl, L or D-tyrosyl, L or D-lysyl and L or D-ornithyl, a group of the formula DE wherein D represents the N-t-butyloxy-carbonyl (BOC), tert-amyloxycarbonyl (tACO), N-benzyloxycarbonyl, N-benzoyl, N-acetyl, N-pivaloyl, N-carbamoyl or N-succinyl radical, and E stands for a single bond, a radical derived from an amino acid selected from

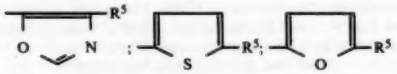
the group of D or L-pyroglutamyl, L or D-alanyl, β-alanyl, glycyl, L or D-prolyl, L or D-valyl, L or D-phenylalanyl, L or D-homocysteyl, L or D-aspartyl, L or D-glutamyl, L or D-histidyl, L or D-methionyl, L or D-threonyl, L or D-seryl, L or D-cysteyl, L or D-leucyl, L or D-isoleucyl, L or D-arginyl, L or D-tryptophanyl, L or D-tyrosyl, L or D-lysyl and L or D-ornithyl, said amino acid being either unsubstituted or substituted by HSO_3, or a peptide having from 2 to 5 amino acids selected from the group of (L or D)-glutamyl-(L or D)-glutamyl-(L or D)-alanyl-(L or D)-tyrosylglycyl, (L or D)-alanyl-(L or D)-phenylalanyl-(L or D)-isoleucyl-glycyl, (L or D)-alanyl-(L or D)-tyrosylglycyl, (L or D)-lysylglycyl, (L or D)-tyrosyl-β-alanyl, (L or D)-tyrosyl-(L or D)-methionylglycyl, (L or D)-tyrosyl-(L or D)-threonylglycyl, (L or D)-tyrosyl (O-sulphate)-(L or D)-methionylglycyl and (L or D)-tyrosyl (O-sulphate)-(L or D)-threonylglycyl, said peptide being, either unsubstituted or substituted by HSO_3; B represents the L-methionyl, D-methionyl, L-norleucyl, D-norleucyl, L-leucyl, D-leucyl, L-norvalyl or D-norvalyl radical; Y represents H, CH_2OH, $COOR^1$ with R^1 representing hydrogen or an alkyl radical of C_1 to C_4 or $CO\text{-}NHR^2$ with R^2 representing hydrogen, an alkyl radical of C_1 to C_4 or NH_2; m is an integer between 0 and 6; and X represents a radical of formula:



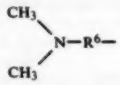
in which n is an integer between 1 and 8, p is an integer between 0 and 3, R^3 stands for H or CH_3, Z stands for a single bond or S, and Q represents a radical selected from the radicals having the formula:



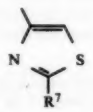
in which R^4 stands for H or an alkyl radical of C_1 to C_4,



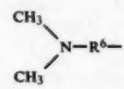
with R^5 standing for H, an alkyl radical of C_1 to C_4, or



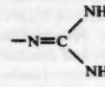
with R^6 representing an alkylene radical of C_1 to C_3; and



with R^7 representing H, an alkyl radical of C_1 to C_4,



with R^6 having the above-described meaning or



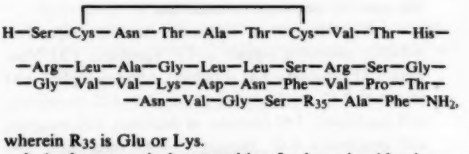
4,530,838

SYNTHETIC CALCITONIN-GENE-RELATED PEPTIDES FOR LOWERING BLOOD PRESSURE OR GASTRIC ACID SECRETION IN MAMMALS

Ronald M. Evans, La Jolla; Larry Swanson, Solana Beach; Wylie W. Vale, Jr., La Jolla; Michael G. Rosenfeld, San Diego; Susan G. Amara, La Jolla; Marvin R. Brown, Del Mar, and Jean E. F. Rivier, La Jolla, all of Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

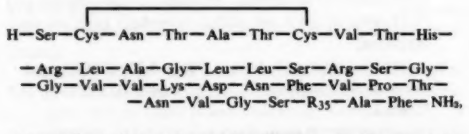
Filed Jul. 8, 1983, Ser. No. 512,421
Int. Cl.³ A61K *37/02*; **C07C** *103/52*
U.S. Cl. 514—11 **11 Claims**

1. A substantially pure synthetic peptide, or a nontoxic addition salt of a synthetic peptide, having the formula:



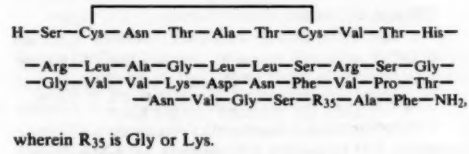
wherein R_{35} is Glu or Lys.

4. A pharmaceutical composition for lowering blood pressure or gastric acid secretion in mammals comprising an effective amount of a substantially pure peptide, or a nontoxic addition salt thereof, having the formula:



wherein R_{35} is Glu or Lys; and a pharmaceutically acceptable liquid or solid carrier therefor.

7. A method for lowering the blood pressure or gastric acid secretion of a mammal, which method comprises administering to said mammal an effective amount of a substantially pure peptide, or a nontoxic addition salt thereof, having the formula:



wherein R_{35} is Gly or Lys.

4,530,839

TRIPHASIC ORAL CONTRACEPTIVE

Samuel A. Pasquale, Basking Ridge, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Sep. 26, 1983, Ser. No. 536,135
Int. Cl.³ A01N *45/00*
U.S. Cl. 514—171 **9 Claims**

1. A method of contraception which comprises administering for 21 successive days to a female of childbearing age a combination of an estrogen and a progestogen in a low but contraceptively effective daily dosage corresponding in estro-

genic activity to 0.02–0.05 mg of 17α-ethinylestradiol and in progestogenic activity to 0.125–0.75 mg of norethindrone for 7 days; for the next 7 days an estrogen daily dosage equal to 0.02–0.05 mg of 17α-ethinylestradiol and in progestogenic activity to 0.50–1.0 mg of norethindrone; and for the next 7 days an estrogen daily dosage equal to 0.02–0.05 mg of 17α-ethinylestradiol and in progestogenic activity of 0.75–2.0 mg of norethindrone; followed by 7 days without estrogen and progestrogen administration, provided that the estrogen daiy dosage is the same for each 7 day period.

4,530,840

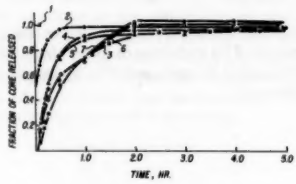
INJECTABLE, LONG-ACTING MICROPARTICLE FORMULATION FOR THE DELIVERY OF ANTI-INFLAMMATORY AGENTS

Thomas R. Tice, Birmingham; Danny H. Lewis, Gardendale; Donald R. Cowsar, and Lee R. Beck, both of Birmingham, all of Ala., assignors to The Stolle Research and Development Corporation, Cincinnati, Ohio and Southern Research Institute, Birmingham, Ala.

Filed Jul. 29, 1982, Ser. No. 402,857

Int. Cl.³ A61K *31/58*

U.S. Cl. 514—179 **12 Claims**



1. An anti-inflammatory agent containing microparticle composition prepared by a process, comprising:

(a) dissolving or dispersing an anti-inflammatory agent selected from the group consisting of a prednisolone, a triamicinolone, a dexamethasone and a β-methasone in a solvent selected from the group consisting of acetone, a halogenated hydrocarbon, an aromatic hydrocarbon. a halogenated aromatic hydracarbon, a cyclic ether, an alcohol and water and dissolving a biocompatible and biodegradable wall forming material in said solvent;

(b) dispersing said solvent containing said anti-inflammatory agent and wall forming material in a continuous phase processing medium of water, toluene, xylene, a synthetic oil or a natural oil;

(c) evaporating a portion of said solvent from said dispersion of step (b), thereby forming microparticles containing said anti-inflammatory agent in the suspension; and

(d) extracting the remainder of the solvent from said microparticles.

4,530,841

6- AND 6,6-DISUBSTITUTED-3-SUBSTITUTED AMINO-1-AZABICYCLO-[3.2.0]HEPT-2-EN-7-ONE-2-CARBOXYLIC ACID

Burton G. Christensen, Scotch Plains, and Ronald W. Ratcliffe, Matawan, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

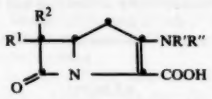
Continuation of Ser. No. 176,818, Aug. 8, 1980, abandoned, which is a continuation-in-part of Ser. No. 119,914, Feb. 8, 1980, abandoned, which is a continuation of Ser. No. 843,379, Oct. 19, 1977, abandoned. This application Jun. 14, 1982, Ser. No. 388,311

The portion of the term of this patent subsequent to Jan. 3, 2001, has been disclaimed.

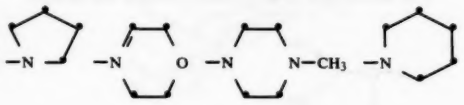
Int. Cl.³ A61K *31/40*; C07D *487/04, 205/08*

U.S. Cl. 514—210 **4 Claims**

1. A compound having the structural formula:



and the pharmaceutically acceptable salts, thereof, wherein: R′ and R″ are independently selected from the group consisting of hydrogen, substituted with 1–3 substituents and unsubstituted: alkyl and cycloalkyl having 1–10 carbon atoms, phenylalkyl and heterocyclylalkyl wherein the alkyl moiety has 1–6 carbon atoms and the heterocyclyl is selected from



wherein the ring or chain substituent or substituents on R′, R″, or the cyclic radical formed by their joinder are selected from amino, mono- or di-alkylamino (each alkyl having 1–6 carbon atoms), hydroxyl, carboxyl, alkoxyl having 1–6 carbon atoms, chloro, bromo, fluoro, nitro, sulfamoyl, phenyl, benzyl, and alkoxycarbonyl having 1–3 carbon atoms in the alkoxyl moiety; and R^1 and R^2 are independently selected from the group consisting of hydrogen, substituted and unsubstituted: alkyl, alkenyl, and alkynyl, having from 1–10 carbon atoms; cycloalkyl, cycloalkylalkyl, and alkylcycloalkyl, having 3–6 carbon atoms in the cycloalkyl ring and 1–6 carbon atoms in the alkyl moieties; phenyl; aralkyl, aralkenyl, and aralkynyl wherein the aryl moiety is phenyl and the alkyl chain has 1–6 carbon atoms; wherein the substituent or substituents relative to the above-named radicals are selected from the group consisting of: amino, mono- or di-alkylamino, hydroxyl, alkoxyl, mercapto, alkylthio, phenylthio, sulfamoyl, amidino, guanidino, nitro, chloro, bromo, fluoro, cyano and carboxy; and wherein the alkyl moieties of the above-recited substituents have 1–6 carbon atoms; when R^1/R^2 is hydrogen, R^2/R^1 is not 1-hydroxyethyl.

4,530,842

2(1H)-PYRIDINONE DERIVATIVES, THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Gerhard Bormann, Münchenstein, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

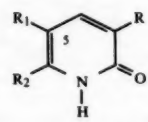
Filed May 12, 1983, Ser. No. 493,933

Claims priority, application Switzerland, May 18, 1982, 3087/82; May 18, 1982, 3091/82; Feb. 15, 1983, 837/83

Int. Cl.³ C07D *213/57*; A61K *31/44*

U.S. Cl. 514—344 **4 Claims**

1. A compound of formula I



I

wherein

R is cyano,

R_1 is phenyl mono- or independently disubstituted by cyano, and

R_2 is hydrogen or alkyl of 1–4 carbon atoms,

in free form or in pharmaceutically acceptable salt form.

4. A method of treating heat insufficiency which comprises administering to an animal in need of such treatment a thera-

peutically effective amount of a compound of claim 1 in free form or in pharmaceutically acceptable salt form.

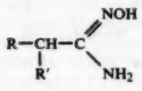
4,530,843

ISOINDOLE AMIDOXIME DERIVATIVES

Daniel Obitz, Antony, France, assignor to Synthelabo, Paris, France

Division of Ser. No. 381,749, May 25, 1982, Pat. No. 4,438,121.
This application Oct. 25, 1983, Ser. No. 545,159
Claims priority, application France, May 25, 1982, 81 10428
Int. Cl.³ A61K *31/40, 31/47;* **C07D** *209/46, 209/48*
U.S. Cl. 514—416 **7 Claims**

1. A heterocyclic amidoxime derivative of the formula:



wherein

R′ is a hydrogen atom or the methyl radical, and

R represents the 1,3-dioxo-1,3-dihydro-2H-isoindol-2-yl or 1-oxo-1,3-dihydro-2H-isoindol-2-yl radical, with the proviso that when R′ represents the methyl radical, said derivative includes racemates and enantiomers thereof, and pharmaceutically acceptable acid addition salts thereof.

7. A method for the treatment of a patient suffering from a complaint of the central nervous system or for the treatment of depression which comprises administering to the patient an amount of a heterocyclic amidoxime derivative of the general formula depicted in claim 1, or a pharmaceutically-acceptable acid addition salt thereof, effective to ameliorate the condition of the patient.

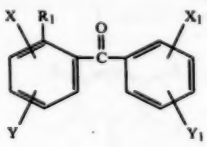
4,530,844

SYNERGISTIC NON-STEROIDAL ANTI-INFLAMMATORY COMPOUNDS AND COMPOSITIONS THEREOF

Richard V. Smerbeck, Hackettstown, and Eugene P. Pittz, Randolph, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jul. 26, 1984, Ser. No. 634,738
Int. Cl.³ A61K *31/12, 31/335, 31/355*
U.S. Cl. 514—458 **16 Claims**

1. A method for the treatment of inflammation in mammals comprising administering a composition having (a) a compound of the formula:



wherein R_1 is H or OH; and X, Y, X^1 and Y^1 represent hydrogen or halogen radicals, lower alkyl radicals C_1–C_8, lower haloalkyl radicals, lower alkoxy radicals C_1–C_8, salts thereof and mixtures thereof; in combination with (b) a compound selected from the group consisting of vitamin E acetate, butylated hydroxy toluene, nordihydroguaiaretic acid, quercetin and mixtures thereof, said combination of compounds being present in amounts of about 0.05% to about 50% by weight of the total composition.

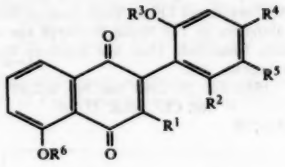
4,530,845

1,4-NAPTHOQUINONE DERIVATIVES AND USE THEREOF

Koichi Ikushima, Toyonaka; Hirokazu Tanaka, Takarazuka; Obe Osamu, Osaka; Eiko Kino, Hadano; Masanobu Kohsaka, Sakai; Hatsuo Aoki, Ikeda; Akira Arakawa, Kusatsu, and Hiroshi Imanaka, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 317,897, Oct. 31, 1981, Pat. No. 4,414,226.
This application Jul. 6, 1983, Ser. No. 511,268
Claims priority, application Japan, Mar. 6, 1980, 55-29675
Int. Cl.³ A61K *31/19, 31/12;* **C07C** *50/12*
U.S. Cl. 514—453 **10 Claims**

1. A derivative, including salts of its carboxy function, of the formula



wherein R^1 is hydrogen, hydroxy, lower alkoxy, or arylthio; R^2 is carboxy; R^3 is hydrogen or lower alkyl; R^4 is lower alkyl; R^5 is hydrogen or halogen; and R^6 is hydrogen, lower alkyl, or lower alkanoyl.

4,530,846

METHOD FOR THE PRODUCTION OF SELENIUM YEAST

Tilak Nagodawithana, Bayside, and Feliks Gutmanis, Milwaukee, both of Wis., assignors to Universal Foods Corporation, Milwaukee, Wis.

Filed Feb. 15, 1983, Ser. No. 466,398
Int. Cl.³ A23L *1/28*
U.S. Cl. 426—62 **13 Claims**

1. A process for producing an edible selenium yeast product suitable for mammalian consumption having an organically bound selenium content of at least about 1000 ppm on a dry yeast weight basis which comprises:

(a) propagating a food grade yeast by maintaining the yeast under aerobic yeast growth conditions in a fermenter;

(b) continuously and incrementally providing said yeast with an assimilable carbon source nutrient added to said yeast in the fermenter wherein the inorganic sulfur content in the nutrient medium is maintained at levels sufficiently low so as to not substantially affect the yield of yeast;

(c) simultaneously and continuously adding in conjunction with the addition of said nutrient, a water-soluble selenium salt that is relatively non-toxic to said yeast cells at concentrations sufficient to provide a final concentration of assimilable organically bound intracellular selenium in said yeast of at least 1000 ppm on a dry yeast solids basis;

(d) recovering the selenium yeast so formed from the fermenter when the yeast growth has reached a predetermined level;

(e) washing the recovered selenium yeast to remove extracellular nutrients and extracellular selenium salts therefrom; and

(f) pasteurizing and drying the washed yeast cells to recover a dried selenium yeast product containing a substantial amount of assimilable organically bound, intracellular selenium and essentially free of extracellular inorganic selenium.

4,530,847

METHOD OF MANUFACTURING FISH AND CHEESE CONTAINING FOOD PRODUCTS

Koichi Natori, Tokyo, Japan, assignor to Natori Shokai Co., Ltd., Tokyo, Japan

Filed Nov. 4, 1983, Ser. No. 548,786
Claims priority, application Japan, Nov. 4, 1982, 57-193611
Int. Cl.[3] A23L *1/325*
U.S. Cl. 426—274 4 Claims

1. A method of manufacturing a foodstuff made of fish and cheese as principal constituents which comprises adding starch and other seasonings to mashed fish meat, kneading them together to form a mixture, forming the kneaded mixture into a sheet-like material having a thickness of about 3–5 mm, heating the sheet-like material at a temperature of 80°–85° C., drying said sheet-like material under such heating conditions that the water content is 17–22%, and the thickness of the thus heated fish sheet-like material is about 1–3 mm, sandwiching cheese having a thickness of 3 to 5 mm and a water content of about 42–43% between two sheets of said fish sheet-like material, applying pressure vertically to the two sheets of fish meat with the cheese sandwiched therebetween by means of roaster plates heated at a temperature of 80°–100° C. so that the surface of the fish meat sheets reaches a temperature of 70°–76° C., thus melting cheese in between so as to cause the inner surface of the fish meat to adhere to the melted cheese, cooling the sandwiched foodstuff under such conditions that its water content becomes about 33–38% and its thickness about 4.5–10 mm, cutting the sandwiched foodstuff in elongated shapes so that is width is about 3–10 mm, and packaging the elongated shapes in a package together with a deoxidant.

4,530,848

METHOD FOR PRODUCING A NON-SEGREGATING INSTANT STUFFING MIX AND PRODUCT THEREOF

Glen M. Bannon, Dover; Darlene A. Hardie-Muncy, Bear, and Ronald P. Wauters, Dover, all of Del., assignors to General Foods Corporation, White Plains, N.Y.

Filed Jul. 27, 1983, Ser. No. 517,864
Int. Cl.[3] A21D *13/00*
U.S. Cl. 426—293 3 Claims

1. A process for making a non-segregating, free-flowing, instant stuffing mix comprising:

(a) obtaining a particle fraction of diced and dried bread crumbs wherein essentially all of the particles pass through a No. 2.5 Tyler screen and are retained on a No. 14 U.S. Standard Sieve and wherein at least 50% by weight of the particles are retained on a No. 5 U.S. Standard Sieve;

(b) uniformly spraying a hydrogenated vegetable oil onto the surface of the bread crumbs at a level of from 5% to 10% by weight of the crumbs;

(c) gently agitating the oil-coated bread crumbs and depositing a powdered seasoning blend onto the agitated crumbs in a manner which uniformly aggregates the powder onto the crumb surfaces at a level of from 5% to 20% by weight of the uncoated crumbs;

(d) admixing particles of rapidly-rehydratable, freeze-dried or puff-dried vegetables with the bread crumb-seasoning blend aggregates, the vegetable particles having a maximum dimension of from 1.5 to 8 mm.; thereafter,

(e) adding dried parsley flakes to the admixture of step (d) at a level of from 0.3% to 1.5% by weight of the uncoated crumbs; and then,

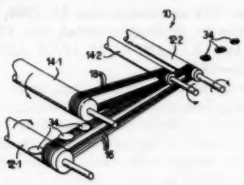
(f) packaging the admixture of step (e).

4,530,849

METHOD OF PRODUCING CORRUGATED CRISPS

Haydn T. Stanley, Muldersdrift, and Derek J. Drake, Pretoria, both of South Africa, assignors to Willards Foods Limited, Johannesburg, South Africa

Continuation of Ser. No. 247,380, Mar. 25, 1980, abandoned.
This application Mar. 1, 1984, Ser. No. 583,792
Claims priority, application South Africa, Apr. 28, 1980, 80/2546
Int. Cl.[3] A21C *3/00*; A21D *8/02*; A23P *1/00*
U.S. Cl. 426—439 2 Claims



1. A method of producing corrugated crisps from a food product having a soft, moist and substantially fiberless consistency and which is plastically deformable when raw, the method comprising:

providing separate flat pieces of the raw food product;

providing a plurality of laterally spaced flexible lower forming elements each being in the form of a longitudinally extending endless loop having an upper and a lower run and having a longitudinal dimension which is substantially greater than that of said pieces;

providing a plurality of laterally spaced flexible upper forming elements each being in the form of a longitudinally extending endless loop having an upper run and a lower run and having a longitudinal dimension which is substantially greater than that of said pieces;

synchronously rotating the lower and upper forming elements, the lower and upper forming elements being arranged so that, upon rotation, the upper runs of the lower forming elements extending in a common plane and the lower runs of the upper forming elements extending in a common plane move synchronously forward from an entry end of the forming elements to an exit end of the forming elements, the upper runs of the lower forming elements converge towards each other from the entry end to the exit end, and the lower runs of the upper forming elements converge towards each other from the entry end to the exit end, and the lower runs of the upper forming elements converge towards the plane of the upper runs of the lower forming elements from the entry end to the exit end to the extent that the lower runs of the upper forming elements enter at least partly into spaces between the upper runs of the lower forming elements, said lower and upper runs being laterally displaced toward one another thereby bringing together the lower runs of the upper forming elements and the upper runs of the lower forming elements:

providing hot cooking oil adjacent the exit end of the forming elements; and

depositing said pieces on the upper runs of the lower forming elements at the entry end, conveying said pieces by the lower forming elements toward said exit end in order to engage said pieces with the lower runs of the upper forming elements and form said pieces into corrugated shapes by the entry of the lower runs of the upper forming elements into the spaces between the upper runs of the lower forming elements, selecting the angle by which the upper runs of the lower forming elements and the lower runs of the upper forming elements respectively converge towards each other so that substantially no lateral stretching of the pieces occurs while said pieces are being formed into said corrugated shapes, dropping said corrugated

shaped pieces directly from the exit end of the forming elements into the hot cooking oil and thereafter frying said shaped pieces to form corrugated crisps.

4,530,850

POWDERED COMPOSITIONS AND PROCESS FOR THE MANUFACTURE OF NON-GELLED ACIDIFIED MILK PRODUCT DRINKS

Moshe Trop, Beer Sheva, Israel, assignor to Ben-Gurion University of the Negev Research and Development Authority, Israel

Continuation-in-part of Ser. No. 386,787, Jun. 7, 1982, abandoned. This application Jun. 13, 1984, Ser. No. 620,031
Claims priority, application Israel, Jun. 10, 1981, 63071
Int. Cl.³ A23C 9/156, 11/06; A23L 2/38
U.S. Cl. 426—584 **14 Claims**

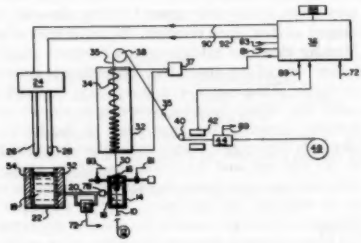
1. A powdered composition that, upon mixing with milk, forms a non-gelled, acidified, milk-product drink without curdling of the milk proteins, said composition comprising about 1 to about 9 percent of an edible acid, about 0.5 to about 1.9 percent of an instant cold-water soluble gelatine, about 1 to about 10 percent of an edible natural or modified polysaccharide gum, about 20 to about 90 percent sweetening agents and about 0.0 percent to an effective amount of flavoring and coloring agents, all percentages being by weight of the powdered composition, and the ratio of said gum to said gelatine being between about 2:1 and 10:1 to assure the formation of a non-gelled, liquid, milk-product drink.

4,530,851

PRODUCTION OF DIELECTRIC INSULATION LAYERS UPON ELECTRICAL CONDUCTORS

Michael A. Shannon, Glenburnie, and John A. McDade, Kanata, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 6, 1984, Ser. No. 597,737
Int. Cl.³ B05D 5/12
U.S. Cl. 427—9 **6 Claims**



1. A method of providing an electrical conductor with an insulation layer comprising a layer of dielectric carrier and magnetically permeable particles dispersed within the carrier, the method comprising:

maintaining substantial homogeneity in a fluid mixture of a fluid carrier and a quantity of the magnetically permeable particles;

moving the conductor through the mixture and vertically through a die means to coat the conductor with a fluid layer of the mixture;

drying the fluid carrier to form the dried insulation layer with the particles substantially homogeneously dispersed within the dried carrier;

controlling the thickness of the dried insulation layer by monitoring the thickness or diameter of the dried layer and, if monitored values differ from that required, varying the rate at which the fluid mixture passes through the die means to adjust monitored values towards that desired; and

controlling the quantity of particles dispersed within the carrier by monitoring the quantity of particles by passing the conductor after emergence from the die, concentrically through a magnetic field so as to cause the particles surrounding the conductor to influence the strength of a characteristic of the field and produce signals corresponding to the strength of the influenced characteristic and to the quantity of particles effectively influencing the characteristic, and upon an evaluation of signals differing from that which represents a desired quantity of particles, operating a control means to adjust input of particles or fluid carrier into the mixture to provide the desired quantity of particles in the layer.

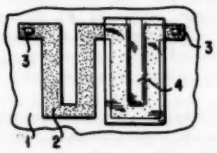
2. A method according to claim 1, including controlling the quantity of particles dispersed within the fluid mixture by passing the homogeneous mixture into an application container for coating the conductor with a fluid layer while moving the mixture through another magnetic field as it moves towards the application container, the particles influencing a characteristic of the other field, producing signals corresponding to the influenced characteristic of said other field and to the quantity of particles effectively influencing that characteristic, and upon an evaluation of signals differing from that which represents a desired quantity of particles in the mixture, operating a control means to provide a primary adjustment for input of particles or fluid carrier into the mixture to provide the desired quantity of particles in the mixture, operation of the control means by evaluated signals associated with the quantity of particles after emergence from the die providing a secondary adjustment for the input of particles or fluid carrier into the mixture.

4,530,852

METHOD FOR PRODUCING A THIN FILM RESISTOR

Hermann Birnbreier, Sandhausen, and Helmut Haas, Leimen, both of Fed. Rep. of Germany, assignors to Brown, Boveri & CIE AG, Mannheim-Käfertal, Fed. Rep. of Germany

Filed Jan. 16, 1984, Ser. No. 570,743
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1983, 3301665
Int. Cl.³ B05D 5/12
U.S. Cl. 427—102 **9 Claims**



1. A method of treating a film resistor with an exposed resistance area produced by vapor deposition or cathode sputtering techniques, to produce a thin film resistor which remains constant in electric resistance during long-term operation, which comprises covering part of the resistance area of the resistor by an electrically insulating layer which prevents oxygen diffusion into the covered area and causes a decrease in the resistance of the resistor during aging, with the remaining resistance area free of any layer which prevents oxygen diffusion into the remaining resistance area, proportioning the covered resistance area to the uncovered resistance area to cause the overall value of the electric resistance to remain constant during long-term operation.

4,530,853
NON-CONDUCTING OXIDATION RETARDANT COATING COMPOSITION FOR CARBON AND GRAPHITE

Steve F. Lewallen, Elizabethton; Billy J. Lewis, Johnson City; James R. McIver, Elizabethton; Robert E. Hoss, Johnson City, and Edward W. Pierce, Elizabethton, all of Tenn., assignors to Great Lakes Carbon Corporation, New York, N.Y.

Filed Jun. 6, 1984, Ser. No. 617,932
Int. Cl.³ B05D 5/12
U.S. Cl. 427—113 **27 Claims**

1. A method for applying an electrically non-conducting multiple protective coating composition to a carbon or graphite body comprising:

(a) applying a first coating of a sprayable aqueous slurry of a high temperature cement consisting principally of a mixture of about 55–65 wt. % SiO_2, about 25–35 wt. % Al_2O_3 and about 5–15 wt. % Na_2SiO_3;

(b) drying said first coating;

(c) applying a second coating over said first coating of an aqueous slurry comprising:

(1) a mixture consisting of about 85–100 wt. % SiC, 0–15 wt. % graphite and 0–15 wt. % SiO_2,

(2) B_2O_3,

(3) Na_2SiO_3 and

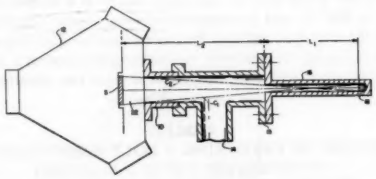
(4) $NH_4H_2PO_4$; and

(d) drying said second coating.

4,530,854
FOCUSING DEVICE FOR EXTERNAL FLASHING OF GETTERS

Hans P. Meyerhoff, Fridley, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 23, 1982, Ser. No. 422,335
Int. Cl.³ H01S 3/08; H01J 9/39
U.S. Cl. 427—162 **3 Claims**



1. A method of introducing getter material into a cavity in a ring laser gyro comprising steps; evacuating said cavity

flashing the getter material outside the evacuated cavity;

forming a beam of getter atoms from said flashed getter material directed toward a predetermined region in said evacuated cavity;

depositing said getter atoms on said region.

4,530,855
METHOD OF COATING FIBER MATERIALS WITH RESIN

Dean Youngkeit, Willard, Utah, assignor to Thiokol Corporation, Chicago, Ill.

Filed Jun. 15, 1983, Ser. No. 504,634
Int. Cl.³ B05D 3/12, 1/28
U.S. Cl. 427—175 **2 Claims**

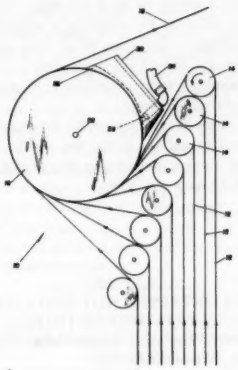
1. A method of coating fiber materials with resin comprising the steps of

pulling each of a plurality of fibers under tension from a source of fibers over the surface of an individually associated one of a plurality of positioning rollers having axes of rotation of which are all parallel,

positioning said positioning rollers in a substantially evenly spaced relationship on a line that is parallel to a tangent to the curvature of the adjacent surface of said drive roller applicator,

gathering said fibers from said positioning rollers into a fibrous band on the surface of an adjacent rotatable resin drive roller applicator having an axis of rotation that is parallel to the axes of rotation of said positioning rollers,

applying resin under pressure on a circumferential portion of the surface of said drive roller applicator that is opposite to the portion of the circumference thereof about which the fibrous band is looped, the rate at which resin is deposited on the surface of said drive roller applicator being controlled by the rate of rotation of said drive roller applicator, said applicator being driven by the fibers being pulled in tension around the surface thereof,



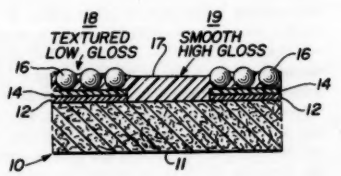
confining the wetting of the surface of said drive roller applicator to a portion of the length thereof sufficient to wet the fibrous band, and

working the resin into said fibers as the fibrous band is looped around and pulled under tension over a substantial portion of the circumference of said rotatable drive roller applicator.

4,530,856
METHOD FOR MAKING DECORATIVE LAMINATE

William J. Kauffman, Lititz, and Ralph W. Wright, Lancaster, both of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Division of Ser. No. 402,954, Jul. 29, 1982, Pat. No. 4,450,194.
This application Mar. 12, 1984, Ser. No. 588,339
Int. Cl.³ B05D 3/02, 5/02
U.S. Cl. 427—197 **18 Claims**



1. A method for making a decorative laminate having differential surface texture and differential surface gloss suitable as a floor covering, said method comprising:

applying to a substrate material a vinyl plastisol printing ink composition in register with a printed image on said substrate;

applying an excess of PVC resin particles of type GP PVC resin having a particle size diameter between about 4 mils and about 20 mils, a cell classification number of 4 and a plasticizer absorption greater than about 40 grams per 100 grams of said PVC resin over said printing ink composition and the surface of said substrate and removing the excess of said PVC resin particles that do not adhere to said printing ink composition;

heating said substrate to gel said vinyl plastisol printing ink thereon and thereby firmly adhere said PVC resin particles to said vinyl plastisol printing ink;

forming a top resinous layer on said PVC resin particles and the surface portion of said substrate intermediate said PVC resin particles by applying a transparent synthetic organic polymer over said PVC resin particles and the exposed surface of said substrate; and

heating the resulting top resinous layer thereby to provide a fused decorative laminate;

whereby the regions of said decorative laminate overlying said PVC resin particles exhibit a rougher surface texture and a lower gloss than the regions of said decorative laminate intermediate said PVC resin particles.

4,530,857

GLASS CONTAINER HOT END COATING FORMULATION AND METHOD OF USE

Georg H. Lindner, Vlissingen, Netherlands, assignor to M&T Chemicals Inc., Woodbridge, N.J.

Filed May 13, 1983, Ser. No. 494,242
Int. Cl.³ B05D *3/02*
U.S. Cl. 427—314 **12 Claims**

1. The method of coating glass containers, comprising the steps of:

(a) heating the surface of a glass container to at least 800° F.;

(b) spraying the surface of the glass with a glass coating formulation which is stable with respect to the appearance of solid particles during storage and use thereof comprising monoalkyltin trihalide and about 0.5 to 10 parts by weight per hundred parts monoalkyltin trihalide of a dopant selected from the group consisting of:

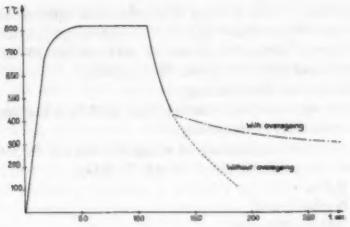
monohydric alcohols represented by the formula ROH where R is a C_1–C_8 straight or branched chain group; dihydric alcohols represented by the formula, $HO—(CH_2)_m—OH$, where m=2 to 6; glycol ethers represented by the formula, $R^1—(OCH_2CH_2)_nOH$, where R^1 is a C_1–C_8 group and n=1 or 2; ethers represented by the formula, $R^2O_2CR^3$, where R^2 is a C_1–C_8 straight or branched chain group, $R^4(OCH_2CH_2)_s$ where R^4 is a C_1–C_4 group, s=1 or 2, and R^3 is a C_1–C_4 group or $—CH_2OH$; ketones having the formula, R^5COR^6, where R^5 and R^6 are C_1–C_6 straight, branched chain or cyclic groups, esters represented by the formula, $R^7(OCH_2CH_2)_rOR^8$ where R^7 and R^8 are C_1–C_4 groups or $—(CH_2)_p—$ where p=4 or 5, or $—CH_2CH_2OCH_2CH_2—$, where r=0–4; aldehydes represented by the formula R^9COH, where R^9 is C_1–C_3; anhydrides represented by the formula, $R^{10}CO_2COR^{11}$, where R^{10} and R^{11} are a C_1–C_3 group; formamides represented by the formula, $R^{12}R^{13}NCOH$, where R^{12} and R^{13} are a C_1–C_4 group; and acetals represented by the formula, $R^{14}(CH_2)_qCH(OR^{15})_2$, where R^{14} is H, OH, $(CH_3)_2N$, or $(C_2H_5)_2N$, q=0 or 1, and R^{15} is a C_1–C_2 group or a nitrile, $R^{16}CN$ where R^{16} is a C_1–C_3 group, and mixtures thereof and wherein the combination of the dopant and the glass coating material has a flash point of at least 60° C. said material preventing the appearance of solid particles without adversely affecting the quality of the final coating.

4,530,858

PROCESS AND INSTALLATION FOR CONTINUOUS MANUFACTURING OF AN OLD (OVER-AGED) STEEL BAND HAVING A COATING OF ZN, AL OR ZN-AL ALLOY

Charles Brun, Montataire, France, assignor to Union Siderurgique du Nord et de L'est de la France (Usinor), Puteaux, France

Filed May 23, 1984, Ser. No. 612,958
Claims priority, application France, May 24, 1983, 8308508
Int. Cl.³ B05D *3/00*
U.S. Cl. 427—320 **5 Claims**



1. Continuous process for coating a cold laminated steel band with a layer of Zn, Al or with a Zn-Al alloy, comprising a heating thermic cycle which comprises a very rapid rise in temperature until a temperature comprised between 550° and 750° C. at a speed of 20° to 200° C./s., slower continued rise in temperature until a maintenance temperature comprised between 650° and 850° C. at a speed of 5° to 50° C./s. and maintaining this temperature for about 3 minutes, followed by rapid cooling at a speed of 5° to 50° C./s of from the maintenance temperature to the coating bath temperature, a tempered coating in the metal bath of coating in fusion at a temperature of 460° to 500° C., and a subsequent cooling, characterized in that after the tempered coating, the coated steel band is subjected to an over-ageing treatment by maintaining the band at a temperature between 430° and 270° C. for at least two minutes.

4,530,859

METHOD OF PREPARING A POLYMERIC COATING COMPOSITION FROM A BLOCKED ISOCYANATE-FUNCTIONAL POLYMERIC COMPOUND AND A CROSSLINKING AGENT WHICH IS INSOLUBLE IN APROTIC SOLVENTS

Raymond E. Grunzinger, Jr., New Scandia Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 333,810, Dec. 23, 1981, abandoned. This application Nov. 15, 1982, Ser. No. 441,319
Int. Cl.³ B05D *3/02*
U.S. Cl. 427—385.5 **14 Claims**

13. A method of preparing a thermally cured polymeric layer wherein the cured polymer contains urethane or urea linkages, comprising the steps of:

(a) providing an isocyanate-functional polymeric compound which has more than about 70 percent of the isocyanate groups masked by agents that can be removed by heating;

(b) adding a crosslinking agent, which is substantially insoluble in aprotic solvents to said masked isocyanate-functional polymeric compound, and allowing said crosslinking agent and said masked isocyanate-functional polymeric compound to react at an elevated temperature for a period of time which is sufficient to unmask no more than about one-third of said mask isocyanate-functional polymer, in order to partially react said crosslinking agent and said unmasked isocyanate-functional polymer so as to form an oligomer in which the unreacted portions of said

crosslinking agent and said masked isocyanate-functional polymer are soluble;

(c) maintaining said reaction at said elevated temperature until a homogeneous liquid solution results;

(d) coating said homogeneous liquid solution on a substrate so as to form a layer; and

(e) heating said layer to a temperature which is at least equal to the minimum dissociation temperature for said masking agent, for a period of time sufficient to cure said thermally cured polymeric layer.

4,530,860

MIGRATION-FREE SIZE FOR GLASS FIBERS

Carl A. Johnson, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 162,854, Jun. 25, 1980, Pat. No. 4,455,400. This application Mar. 8, 1984, Ser. No. 587,729

Int. Cl.³ B32B *15/00*

U.S. Cl. 427—386 **8 Claims**

1. A method of treating glass fibers which comprises depositing on the glass fibers a size comprising from about 5 to about 30 percent by weight of a silane coupler, from about 10 to about 65 percent by weight of a lubricant, from about 10 to about 70 percent by weight of an epoxy film former and an amount, up to about 8 percent by weight, of a volatile blocking agent sufficient for blocking the reaction of said coupler and said film former, said size having a viscosity not greater than 2000 cps and carrier being substantially absent therefrom.

4,530,861

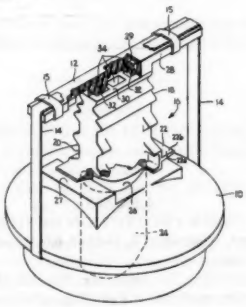
METHOD AND APPARATUS FOR MASKING A SURFACE OF A BLADE MEMBER

David F. Sippel, and Robert L. Kearns, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 19, 1983, Ser. No. 562,940

Int. Cl.³ B05D *3/00;* **B05C** *13/02;* **B24C** *1/04*

U.S. Cl. 427—444 **6 Claims**



1. A method for masking portions of a member, wherein said member is a metallic blade comprising a first portion having a base, a platform first surface facing the base, and a shank therebetween, and a second portion having an airfoil connected to a platform second surface facing the airfoil, the base having a surface selected to be masked from treatment and including a port therein, the selected surface being spaced from the second portion, the method for masking the selected surface of the base, the airfoil and the second platform surface comprising the steps of:

disposing the airfoil in a holding means through an opening in the holding means shaped to releasably enclose the periphery of the airfoil;

providing a substantially rigid mask member which is distinct from the holding means and which includes an elastically deformable mask surface having a positioning protrusion for insertion into the port, the mask surface being contoured substantially to the selected base surface;

covering the base surface with the mask surface, with the protrusion within the port; and then,

securing the mask member at the base surface elastically with an elastic means between the mask member and the holding means, the elastic means pressing the platform second surface against the holding means.

3. Masking apparatus for use with a turbine engine blade member which includes a first portion to be treated comprised of a base having a base surface selected to be masked from treatment and including a port therein, a platform having a first surface facing the base, and a shank therebetween, the blade member also including a second portion comprising an airfoil extending from the platform at a second platform surface facing the airfoil, the selected surface being spaced from the second portion, the masking apparatus comprising:

an airfoil holding means including an opening therein shaped to the contour of the air foil of the blade member to releasably hold and enclose the airfoil portion;

a substantially rigid mask member distinct from the airfoil holding means and including an elastically deformable mask surface having a positioning protrusion for insertion into the port and contoured substantially to the selected base surface; and

elastic strap means secured between the mask member and the airfoil holding means.

4,530,862

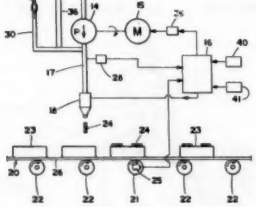
CONTROL SYSTEM AND METHOD FOR DISPENSING A LIQUID

David Kerzel, Pompano Beach, Fla., assignor to Spraymation, Inc., Fort Lauderdale, Fla.

Filed Apr. 29, 1983, Ser. No. 489,790

Int. Cl.³ B05D *5/10;* **B05C** *11/10*

U.S. Cl. 427—445 **13 Claims**



1. A system for dispensing a liquid onto a product moving along a product conveyor line at a speed which may vary, comprising

a supply of liquid

pump means for pressurizing said liquid supply to a liquid operating pressure

a liquid dispensing applicator

conduit lines connecting said supply of liquid, said pump means and said applicator

means for controlling the dispensing of the liquid at a predetermined location on the product and for controlling the dispensing time of the liquid in accordance with the speed of the conveyor line, and

means for controlling the dispensing of the liquid to dispense a predetermined amount of liquid comprising a controller operable to receive at least two input signals and to send out at least one output signal, said input signals corresponding to the liquid operating pressure and a predeter-

mined liquid operating pressure, said liquid operating pressure corresponding to the amount of liquid being dispensed, said controller being further operable to compare said input signals, determining the difference therebetween, and outputting said output signal in accordance with said difference, and wherein said control means for dispensing a predetermined amount of liquid further comprises means connected to said pump means for receiving said output signal and for adjusting said pump means to adjust said liquid operating pressure to substantially coincide with the predetermined liquid pressure.

13. In a liquid dispensing system adapted to dispense by pressure, a liquid onto a product moving in accordance with a product conveyor line, said dispensing system including a supply of liquid pump means for pressurizing said liquid to a liquid operating pressure, a liquid dispensing applicator, conduit lines connecting said liquid supply, pump means and applicator, and control means for controlling the dispensing of the liquid in accordance with the speed of the conveyor line for a predetermined time and at a predetermined location on the product, a method for controlling the amount of liquid dispensed comprising the steps of comparing the liquid operating pressure with a predetermined liquid pressure and inputting the difference to a control device which adjusts the liquid operating pressure by adjusting said pump means to substantially coincide with the predetermined liquid pressure, said liquid operating pressure corresponding to the amount of liquid being dispensed.

4,530,863

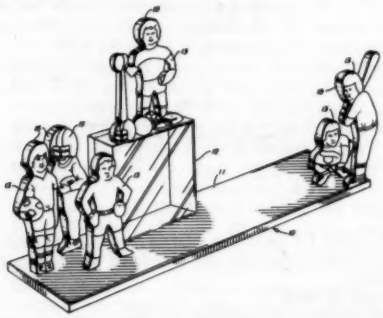
ART OBJECTS AND METHODS OF PRODUCING SAME

Richard W. Seeger, 7307 E. Cypress, Scottsdale, Ariz. 85257

Filed Mar. 4, 1983, Ser. No. 472,210

Int. Cl.³ B44C *3/06*

U.S. Cl. 428—13 **9 Claims**



1. An art object comprising: a base member; a plurality of discrete contoured photographic images preselected to depict varied vocational, avocational and personality traits of a featured person; a plurality of dimensionally stable backings, each contoured to conform to the contour of a different one of said photographic images and having a mounting surface defined thereupon, each one of said images being secured in registered relationship with a corresponding one of said dimensionally stable backings, each of said mounting surfaces being secured to said base member at a location predetermined for each of said backed images.

4,530,864

POROUS CERAMIC STRUCTURE

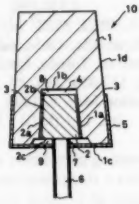
Masuo Sugie, Tokoname; Koji Kurihara, Kariya; Yoshiro Aiba, Anjo; Nobiru Komatsu, Tokai; Haruo Ootuka, Ohbu, and Kaoru Nishikido, Aichi, all of Japan, assignors to Toshiba Ceramics Co., Ltd. and Nippon Steel Corporation, both of Tokyo, Japan

Filed Aug. 28, 1984, Ser. No. 645,106

Claims priority, application Japan, Sep. 2, 1983, 58-161469

Int. Cl.³ B32B *1/00, 3/26, 5/32*

U.S. Cl. 428—35 **9 Claims**



1. A porous ceramic structure adapted in a molten metal container in a way such that said structure pierces the wall of said container for introducing a gas thereinto, said structure comprising:

a main body made of a porous ceramic material and having a recession on the side positioned adjacent to the external surface of said container; and

a sub-body made of a porous ceramic material fitted in said recession of said main body.

4,530,865

CABLE PROTECTION DEVICE

Walter Sprenger, Algersdorf 4, D-8565 Kirchensittenbach, Fed. Rep. of Germany

Filed Dec. 23, 1983, Ser. No. 565,213

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1982, 8236831; European Pat. Off., Apr. 30, 1983, 83104253.6[U]

Int. Cl.³ B32B *27/00*

U.S. Cl. 428—36 **14 Claims**

1. A cable protector device for protectively enclosing a cable having a longitudinal extent, comprising:

a first longitudinally extending leg;

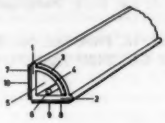
a second longitudinally extending leg joined, at an angle, to said first leg;

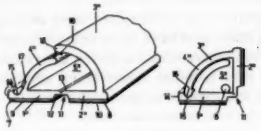
said first and second legs defining therebetween a space for receiving the cable;

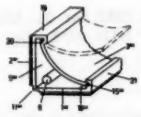
a first longitudinally extending arm extending away from said first leg into said space, said arm including at least one flexible cover portion extending toward, and engagable with, said second leg;

said at least one cover portion, when engaged with said second leg, forming with said first and second legs a hollow body for enclosing the cable;

said first and second legs, said first arm and said at least one cover portion being unitary with one another; and







at least one surface of said first and second legs opposite said space including a self-adhesive coating covered by a peel-off-backing.

4,530,866

RUBBER ROLLER FOR SPINNING

Hideo Inaguma, Hirakata, Japan, assignor to Yamauchi Rubber Industry Co., Ltd., Hirakata, Japan

Filed Oct. 12, 1983, Ser. No. 541,272
Int. Cl.³ B65H *57/14*
U.S. Cl. 428—36 **11 Claims**

1. A rubber roller for spinning comprising a rubber cot force-fitted on a metal core with an interference in the range of 0.5–2.0 mm, said rubber cot having an inner and an outer rubber layer bonded together with an intermediate woven cloth or sheeting reinforcing layer, said inner rubber layer having a thickness in the range of 0.5–3.0 mm and said reinforcing layer having a thickness in the range of 0.1–0.5 mm.

4,530,867

SELF-ADHERING MEMBERS

Edith C. Gorman, 485 Bennetts Farm Rd., Ridgefield, Conn. 06877

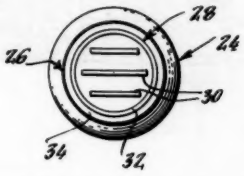
Filed Oct. 18, 1983, Ser. No. 543,015
Int. Cl.³ B32B *27/06, 27/08, 27/10*
U.S. Cl. 428—41 **5 Claims**

1. A self-adhering member in the form of an eating accessory or pattern component, comprising:

a lightweight plastic or paper member having a specific configuration for holding solid or liquid food or in the form of a pattern component for making a specific article of clothing from fabric;

each said member having an upper surface and a lower surface, said lower surface being dimensioned to support said member when said member is placed on a supporting surface;

a first group of rectangularly shaped adhesive segments including a plurality of discrete rectangularly shaped adhesive segments affixed to said lower surface for adhering to the supporting surface when placed in pressure contact therewith, said rectangularly shaped discrete adhesive segments being arranged on said lower surface substantially parallel to one another;



a second group of contiguous adhesive segments affixed to said lower surface and spaced inwardly from the periphery of said member in a pattern substantially conforming to the configuration of the periphery of said member; and

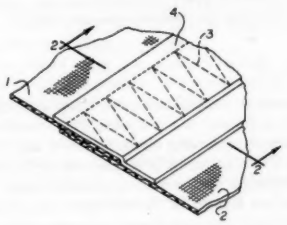
peelable adhesive strips overlying said adhesive segments to prevent adherence of said member to an object until said peelable adhesive strips are removed from said member exposing said adhesive segments and said exposed adhesive segments are placed in pressure contact with the supporting surface.

4,530,868

ELASTOMER-COATED CLOTH COMPOSITE

Hideo Shinmi, Ichihara, and Yoshitaka Kubota, Chiba, both of Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Dec. 14, 1983, Ser. No. 561,603
Claims priority, application Japan, Dec. 30, 1982, 57-227944
Int. Cl.³ B32B *3/00*
U.S. Cl. 428—57 **7 Claims**



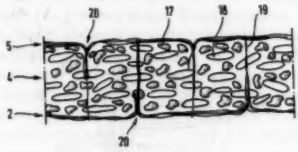
1. A water-impermeable elastomer-coated cloth composite consisting essentially of a first water-impermeable elastomer-coated cloth and a second water-impermeable elastomer-coated cloth, ends of the mutually adjacent first and second cloth being in overlapped contact, the overlapped ends being stitched together in such a way that a sewn portion is made by thread passing up and down through the overlapped ends, and in addition, adhesive tape, of the type which bonds upon contact to a surface without requiring a cure time, of such a width that it is adhered over the sewn portion and is adhered to both the first water-impermeable elastomer-coated cloth and the second water-impermeable elastomer-coated cloth beyond the sewn portion, the composite being of sufficient size to produce building roofs and large-scale tent material.

4,530,869

HEAT PACK AND PROCESS FOR THE PREPARATION OF A HEAT PACK

Gunter H. Tesch, 22, Rte. de la Heitera, Fribourg, Switzerland (CH-1700)

Filed Aug. 26, 1983, Ser. No. 526,816
Claims priority, application Switzerland, Sep. 9, 1982, 5356/82
Int. Cl.[3] B32B 5/06, 31/18
U.S. Cl. 428—69 33 Claims



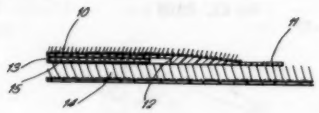
1. A heat pack comprising an inner layer located between two outer layers, the inner layer comprising an earth-like mass and a melting mass of wax and at least one of the outer layers comprising an actively needle bondable fiber fleece, said layers connected together by means of holding fibers.

4,530,870

FLOOR MAT COMBINATION AND DETACHABLY SECURABLE FLOOR MAT

Peter C. Brazier, Heath & Reach, England, assignor to Walk Off Mats Limited, England

Filed May 9, 1983, Ser. No. 492,590
Int. Cl.[3] B32B 3/02, 33/00
U.S. Cl. 428—95 11 Claims



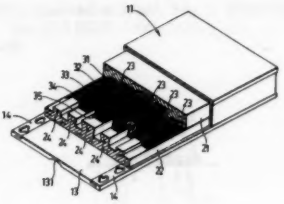
1. A floor mat combination comprising at least one means detachably securable to a carpeted floor surface having a locking element projecting upwardly from said floor surface and having side walls facing in at least two different directions, and a mat having a substantially continuous upper surface and a lower surface formed of flexible sheet material, said sheet material having a downwardly-facing recess having an outline adapted to lie in close proximity to the outline of the side wall of said locking element with at least one wall means forming abutments facing opposite to said two different directions within the perimeter of the mat lower surface, said wall means extending generally perpendicular to the mat, the recess of the mat being arranged so that when the mat overlies the locking element, the wall means on the mat is in close proximity to said side walls of the locking element and thereby restricts lateral movement and/or rotation of the mat relative to the locking element in said different directions, the thickness of said flexible sheet material in said recess on one side of the wall means being less than the thickness of the sheet material on the other side of said wall means by an amount approximately equal to the projection of the locking element from the carpeted floor surface.

4,530,871

SKI CONSTRUCTION

Chin-San You, No. 3, La. 1029, Fong-Shih Rd., Fong Yuang City, Taiwan

Filed Jul. 18, 1984, Ser. No. 632,037
Int. Cl.[3] B32B 5/28, 21/10
U.S. Cl. 428—111 4 Claims



1. A composite structural member which comprises at least two wooden layers and a woven fiber layer impregnated with a thermosetting resin, said fiber layer being adhesively bonded to and sandwiched between said wooden layers and the opposing surfaces of said wooden layers being provided with rib members which are meshed to each other.

4,530,872

TRANSFER HAVING ADHESIVE PASTE COAT

Vincent S. Pernicano, 2833 Railroad St., Boyne Falls, Mich. 49713

Filed Sep. 30, 1982, Ser. No. 431,225
Int. Cl.[3] B32B 3/18, 5/16
U.S. Cl. 428—200 20 Claims

1. A heat transfer sheeting combination of the type for being applied onto a fibrous article (10) to imprint a design thereon, said combination comprising: a substrate (12); a design coating (14) disposed on said substrate (12); and an adhesive layer (24) disposed on said design coating (14) and being responsive to heat and pressure for adhesively securing said design coating (14) to the article (10) and said adhesive layer (24) being a paste including a nylon resin and a polyester resin and an epoxy resin, said paste including an acrylic emulsion for maintaining said resins in a suspension.

4,530,873

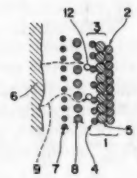
SWEAT-ABSORBENT TEXTILE FABRIC

Hozuma Okada, Kyoto, Japan, assignor to Sakashita Co., Ltd., Kyoto, Japan

Continuation-in-part of Ser. No. 434,707, Oct. 15, 1982, abandoned. This application Jul. 10, 1984, Ser. No. 629,498
Claims priority, application Japan, Oct. 15, 1981, 56-153624[U]; Nov. 13, 1981, 56-169843[U]
Int. Cl.[3] B32B 7/00
U.S. Cl. 428—253 8 Claims

1. A sweat absorbent textile fabric which comprises a first fabric layer having high water permeability and low moisture absorbency and a second fabric layer having a high moisture absorbency substantially higher than said first fabric layer in such that, when in use, the first fabric layer permits moisture to pass therethrough while the second fabric layer absorbs the moisture to keep the first fabric layer dry, the second fabric layer having a capacity to absorb moisture which is 200 to

300% by weight greater than that of the first fabric layer, the first fabric layer having a coarse stitching of 30 to 300 deniers while the second layer has a stitching of 40 deniers or more, providing that the second fabric layer has a finer stitching than the first fabric layer, and the first fabric layer being selected from the group consisting of polyvinyl chloride having a water retentivity within the range of 0 to 3.0% at 20° C. and 95% humidity and a relative thermal conductivity of 6.4 when that of air is taken as 1, a polyester having a water retentivity within



the range of 0.6 to 0.7% at 20° C. and 95% humidity, and nylon having a water retentivity within the range of 8.0 to 9.0% at 20° C. and 95% humidity, while the second fabric layer is selected from the group consisting of cuprammonium rayon having a water retentivity of 21.0 to 35.0% at 20° C. and 95% humidity, rayon having a water retentivity of 25.0 to 30.0% at 20° C. and 95% humidity and cotton having a water retentivity of 24 to 27% at 20° C. and 95% humidity, said first and second fabric layers being integrally connected together to provide a double layered structure.

4,530,874

CHINTZ FABRIC AND METHOD OF PRODUCING SAME

James E. Hendrix, Spartanburg, S.C.; John Y. Daniels, Pineville, and Bobby D. Jackson, Marshville, both of N.C., assignors to Springs Industries, Inc., Fort Mill, S.C.

Filed Aug. 12, 1983, Ser. No. 523,034
Int. Cl.³ B32B 7/00
U.S. Cl. 428—266 **31 Claims**

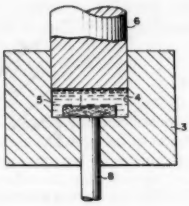
1. A chintz fabric formed of textile yarns and characterized by exhibiting a glossy smooth appearance and having enhanced hand, drapability and durability, said fabric having a cured coating of a silicone polymer forming a thin film at the surface of the fabric and encapsulating the fibers present at the surface of the yarns while also penetrating into the yarns to durably retain the cured silicone polymer coating on the fabric, and said thin film of cured silicone polymer also serving to at least partially fill the interstices between the yarns of the fabric and to form a smooth overall surface to the fabric, imparting a glossy chintz appearance thereto.

4,530,875

SILICON CARBIDE WHISKER COMPOSITE MATERIAL WITH LOW NON WHISKER PARTICLE CONTENT AND METHOD OF MANUFACTURE THEREOF

Tadashi Donomoto; Yoshiaki Tatematsu, and Atsuo Tanaka, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 28, 1983, Ser. No. 536,644
Claims priority, application Japan, Oct. 13, 1982, 57-179648
Int. Cl.³ B22F 1/00, 9/00
U.S. Cl. 428—283 **5 Claims**



1. A composite material comprising a shaped mass of silicon carbide whiskers containing not more than 5% by weight of non whisker particles of diameter greater than 150 microns, and a matrix metal infiltrated into the interstices of said whisker body, said matrix metal being selected from the group consisting of aluminum, magnesium, tin, copper, lead, zinc, and their alloys, in which the bulk density, prior to pressure casting, of the silicon carbide shaped mass is at least 0.07 gm/cm^3 and the compressive strength is at least 0.5 kg/cm^2.

4,530,876

WARP SIZING COMPOSITION, SIZED WARP STRANDS AND PROCESS

George L. Brodmann, Gibsonia, and Ernest L. Lawton, Allison Park, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 12, 1983, Ser. No. 522,756
Int. Cl.³ B32B 5/16
U.S. Cl. 428—283 **20 Claims**

1. A textile yarn warp sizing composition, comprising:
   a. a major amount of the solids of the composition of one or more water soluble, emulsifiable or dispersible fiber forming poly(vinyl alcohol) polymers,
   b. an amount of about 1 to about 50 weight percent of the solids of the composition of a water soluble, emulsifiable or dispersible second film forming polymer dispersible with the poly(vinyl alcohol) having a Tg of less than 70° C. and present in a particle size of less than 5 microns, and
   c. water in an amount to give a solids content to the composition in the range of about 3 to 25 weight percent.

4,530,877

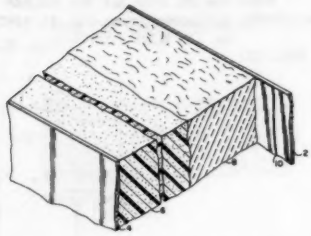
FIRE RESISTANT FOAM INSULATED BUILDING PANELS

John F. Hadley, Bradford Woods, Pa., assignor to Cyclops Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 313,723, Oct. 22, 1981, abandoned. This application Dec. 29, 1982, Ser. No. 454,430
Int. Cl.³ B32B 9/00, 33/00
U.S. Cl. 428—305.5 **12 Claims**

1. A fire resistant foam insulated building panel comprising:
   a. a rigid first skin having an interior face and an exterior face,
   b. a rigid second skin having an interior face and an exterior face positioned so that the interior face of the first skin is opposite and substantially parallel to the interior face of the second skin,

c. a thin fire resistant coating applied to the interior face of the first skin said coating comprised of a film-forming organic polymer having solid reactive ingredients distributed therethrough which when exposed to heat produce nonflammable gases which are trapped by the film-forming organic polymer thereby expanding the thickness of



the fire resistant coating several times it original thickness; and

d. a cellular plastic core between the interior faces of the first and second skins and abutting the interior face of the second skin and the fire resistant coating on the interior face of the first skin.

4,530,878

ENHANCEMENT OF ETHYLENE-VINYL ACETATE ADHESION TO POLYESTER SHEET BY POST-REACTION

Willem F. H. Borman, Evansville, Ind., and John Semen, Baton Rouge, La., assignors to General Electric Company, Pittsfield, Mass.

Filed Apr. 28, 1982, Ser. No. 372,671
Int. Cl.[3] **B32B** *27/30, 27/36, 7/10*
U.S. Cl. 428—334 **14 Claims**

1. A multilayered laminate exhibiting improved interlaminar adhesion, said laminate comprising a layer of copolymer of ethylene and vinyl acetate between layers of poly(alkylene terephthalate), said copolymer being grafted by transesterification to said poly(alkylene terephthalate) layers along the interfaces formed therebetween.

5. A process for the preparation of a multi-layer laminate exhibiting improved interlaminar adhesion, said process comprising:

(a) forming a multilayered structure by providing a plurality of alternating layers comprising sheets or layers of high molecular weight linear polyester and layers formed of pellets of ethylene-vinyl acetate copolymer;

(b) subjecting said multilayered structure to conditions of elevated temperature and pressure for a time sufficient to form a laminate; and

(c) thereafter, post-reacting the laminate so formed by

(i) suspending the laminate in a flow of an inert gas at a temperature between 100° C. and 240° C.; and

(ii) maintaining the laminate under the conditions of step (c) (i) for a period of time sufficient to achieve a T-peel strength of at least 1 in.lb./in.^{2} between the polyester layers and the ethylene-vinyl acetate copolymer layers.

4,530,879

RADIATION ACTIVATED ADDITION REACTION

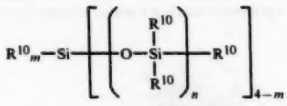
Timothy J. Drahnak, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 4, 1983, Ser. No. 472,158
Int. Cl.[3] **C08G** *77/08, 77/12;* **C09J** *7/02*
U.S. Cl. 428—352 **18 Claims**

1. In a hydrosilation process which comprises reacting a composition comprising a compound having aliphatic unsaturation and a compound containing at least one silicon-bonded hydrogen atom and not having more than two hydrogen atoms attached to any one silicon atom, in the presence of a platinum catalyst, the improvement which comprises using as the platinum catalyst, a (η-diolefin)(σ-aryl) platinum complex having an ultraviolet displaceable group.

14. Radiation curable composition comprising

(a) polyorganohydrosiloxane having the general formula:

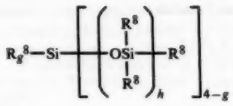


wherein

each R^{10} is independently an alkyl radical, a cycloalkyl radical, a phenyl radical, a hydroxyalkyl radical, a (polyalkoxy)alkyl radical or hydrogen, at least two but no more than 50% of all R^{10} groups being hydrogen;

m is 0, 1, 2 or 3, and

n is a number having an average value from one to 275 such that when considered with the value of m provides a molecular weight to the polyorganohydrosiloxane of between 134 and 20,000, (b) a polyorganosiloxane having the general formula:



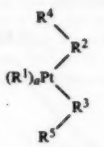
wherein

each R^8 is independently an unhalogenated or halogenated ethylenically unsaturated radical; an unhalogenated or halogenated alkyl radical or cycloalkyl radical, or the phenyl radical, at least 90% of all R^8 radicals being methyl radicals, but no more than 10% of all R^8 radicals being vinyl or propenyl, and at least two of the R^8 radicals being vinyl or propenyl,

h is a number having a value from about 75 to 250 such that the polyorganovinylsiloxane has a viscosity from about 0.3 to 3 pascal-seconds (300 to 3000 centipoise) at 25° C., and

g is 0,1,2, or 3,

(c) a platinum complex represented by the formula:



wherein

R^1 is an alkadiene that is π-bonded to platinum, the alkadiene being a straight or branched chain or a cyclic ring, the alkadiene further being unsubstituted or substituted by one or more groups that are inert in a hydrosilation reaction;

R^2 and R^3 are aryl radicals that are σ-bonded to platinum and are independently selected from monocyclic and polycyclic aryl radicals, said aryl radicals being unsubstituted or substituted by one or more radicals that are inert in a hydrosilation reaction;

R^4 and R^5 are independently hydrogen or an ortho-alkenyl radical, said alkenyl radical being in a straight or branched chain or in a ring, the unsaturated bond of the alkenyl radical being in the 2- or 3-position with respect to the σ-bonded position;

a is zero or one, being zero only when both R^4 and R^5 are ortho-alkenyl radicals, and one when either R^4 or R^5 is not an ortho-alkenyl radical.

18. Sheet material provided with a release surface prepared by applying on at least one side of said sheet material the composition of claim 14 and then exposing said composition to actinic radiation, and a layer of normally tacky and pressure-sensitive adhesive bonded firmly to the other side of said sheet material, thereby forming a pressure-sensitive adhesive tape.

4,530,880

GRANULAR ORGANOHALIDE FLAME RETARDANT ADDITIVE

Akira Taniuchi; Setsuo Nishibori; Hirohito Komori, all of Kyoto, and Motoshige Hayashi, Nara, all of Japan, assignors to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara and Dai-Ichi Kogyo Seiyaku Co., Ltd., Shimogyo, both of, Japan

Filed Jan. 27, 1984, Ser. No. 574,766

Claims priority, application Japan, Jan. 27, 1983, 58-12554; Jan. 27, 1983, 58-12555; Mar. 9, 1983, 58-39722

Int. Cl.³ B32B *5/16, 27/00, 27/20;* **C08K** *5/02*

U.S. Cl. 428—402 **10 Claims**

1. A granular flame retardant additive composition for use in fabricating thermoplastic articles comprising from 70 to 99.5% by weight of the composition of a mixture of at least 50% by weight of an organohalide flame retardant having a melting point above 150° C. and the balance of an organohalide flame retardant having a melting point below 150° C., and from 0.5 to 30% by weight of the composition of a thermoplastic synthetic resin as a binder material of said organohalide flame retardant.

4,530,881

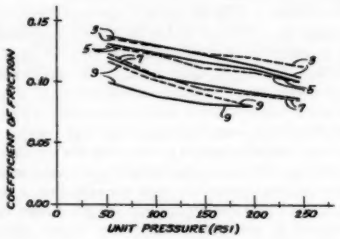
FLUOROELASTOMER-BASED FRICTION MATERIAL HAVING IMPROVED FRICTIONAL PROPERTIES

Muljadi Santoso, Leominster, Mass., and John N. Anderson, Monroe, Conn., assignors to Raymark Industries, Inc., Trumbull, Conn.

Filed Feb. 24, 1983, Ser. No. 469,147

Int. Cl.³ B32B *27/00, 5/16*

U.S. Cl. 428—421 **9 Claims**



1. An improved elastomeric friction material wherein the material is mounted on a rigid backing member and brought into frictional engagement with a relatively moving reaction member, said friction material comprising a cured fluoroelastomer and wollastonite dispersed therein, said material and having a static and dynamic coefficient of friction of from about 0.05 to 0.25, said wollastonite being present in an amount sufficient to reduce the level of the static coefficient relative to the dynamic coefficient of friction such that the ratio of said coefficients approaches one, whereby said fraction material exhibits smooth frictional engagement with said reaction member.

9. An improved elastomeric friction material wherein the material is mounted on a rigid backing members and brought into frictional engagement with a relatively moving reaction member, said friction material comprising at least 20 percent by volume fluoroelastomer as a binder, from about 10 to about 25 percent by volume wollastonite, from about 5 to about 40 percent by volume reinforcing fibers, and from zero to about 60 percent fillers, said wollastonite serving to lower the static coefficient of friction relative to the dynamic coefficient of friction of said material, such that the ratio of said coefficients approaches one.

4,530,882

COATING METHOD AND SILICONE COMPOSITION FOR PSA RELEASE COATING

Gary R. Homan, and David L. Stickles, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 585,748, Mar. 2, 1984,. This application Dec. 24, 1984, Ser. No. 685,525

Int. Cl.³ B32B *9/06;* **B05D** *3/02*

U.S. Cl. 428—452 **14 Claims**

1. A method comprising

(i) applying to a substrate a liquid composition which cures when applied to a substrate and exposed to moisture, said liquid composition being prepared by mixing, under substantially anhydrous conditions, components comprising

(A) 100 parts by weight of an organopolysiloxane fluid bearing an average of at least two silicon-bonded, alkoxysilylorganic radicals per molecule, said radicals having the formula $-QSiR^1_a(OR^2)_{3-a}$ and said organopolysiloxane fluid having the formula $ZR^1_2SiO(Me_2SiO)_x(MeRSiO)_ySiR^1_2Z$,

(B) a titanium ester, or a partial hydrolyzate or a partial alcoholate thereof, soluble in said liquid composition, in sufficient amount to provide from 0.5 to 4.0 parts by weight of titanium, and

(C) from 0.5 to 50 parts by weight of an aminoorganosiloxane bearing an average of at least 1 silicon-bonded aminoorgano radical per molecule, said aminoorgano radical having the formula $-Q(NR^3CH_2CH_2)_mNHR^3$, all other silicon-bonded radicals of the aminoorganosiloxane being selected from the group consisting of siloxane oxygen atoms, R^1 radicals and OR^2 radicals; wherein, independently at each occurrence in the components,

R denotes the $-QSiR^1_a(OR^2)_{3-a}$ radical;

R^1 denotes a monovalent hydrocarbon radical having from 1 to 6, inclusive, carbon atoms;

R^2 denotes a methyl, ethyl, propyl or methoxyethyl radical;

R^3 denotes a H atom or an R^1 radical;

Q denotes an alkylene radical;

Z denotes an R radical or an R^1 radical;

Me denotes a methyl radical;

a has a value of 0 or 1;

x has an average value of from about 50 to 500;

y has an average value of from 0 to $(x+y)/4$; and

m has a value of from 0 to about 3, and

(ii) exposing the applied liquid composition to a moisture-containing environment until the applied composition has attained at least the desired amount of cure.

4,530,883

COMPLEMENTARY COLOR HIGH PRESSURE DECORATIVE LAMINATE

Larry I. Knapp, Cincinnati, Ohio, and Terry P. Drees, Fort Wright, Ky., assignors to Formica Corporation, Wayne, N.J.

Continuation of Ser. No. 461,762, Jan. 28, 1983, abandoned. This application Sep. 13, 1984, Ser. No. 650,559

Int. Cl.³ B32B *27/08, 27/42*

U.S. Cl. 428—503 **8 Claims**

1. A cellulosic paper sheet having impregnated therein from about 25% to about 60%, by weight, based on the weight of the impregnated paper, of a composition of matter comprising a blend of (1) a melamine-formaldehyde resin, wherein the molar ratio of melamine to formaldehyde is in the range of from about 1:1 to about 1:4 and (2) a polymethylol ketone represented by the formula:

$C_xH_{2x-y}O.(CH_2OH)_y$

wherein x is an integer from 3 to 6, inclusive, y is an integer of from 1–6, inclusive, said blend containing from about 10% to 50%, by weight, of said polymethylolketone.

4,530,884

CERAMIC-METAL LAMINATE

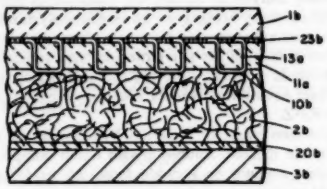
Arnold R. Erickson, Orange; Carlino Panzera, Cromwell, and Robert P. Tolokan, Hamden, all of Conn., assignors to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 337,669, Jan. 7, 1982, abandoned, which is a continuation of Ser. No. 939,888, Sep. 5, 1978, Pat. No. 4,338,380, which is a division of Ser. No. 674,047, Apr. 5, 1976, Pat. No. 4,142,022. This application Mar. 3, 1983, Ser. No. 471,897

The portion of the term of this patent subsequent to Jul. 6, 1999, has been disclaimed.

Int. Cl.³ B32B 5/02, 7/00

U.S. Cl. 428—608 10 Claims



2. An insulating coating of a piston of a gasoline or diesel internal combustion engine comprising:

(1) a piston body having a top portion that can be exposed to combustion gases;

(2) a composite member secured to the top portion of the piston, the composite member comprising a flexible low modulus, low density dimensionally stable metallic web structure having two opposite faces and a first member having a preselected thermal coefficient of expansion secured to one face of the metallic web structure; the other face of the metallic web structure secured to the top portion of the piston which is made of a material with a thermal coefficient of expansion different than the first member; the composite member insulating the top portion of the piston from the combustion gases with the web structure absorbing the effect of the different thermal expansions of the top portion of the piston and the first member that is in direct contact with the expansion gases.

4,530,885

NICKEL OR COBALT ALLOY COMPOSITE

James E. Restall, Camberley, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, England

Continuation of Ser. No. 171,406, Jul. 23, 1980, abandoned. This application Apr. 12, 1982, Ser. No. 367,740

Claims priority, application United Kingdom, Jul. 25, 1979, 7925846

Int. Cl.³ B32B 15/00

U.S. Cl. 428—670 8 Claims

1. A gas turbine engine component having an overlay coating and an intermediate layer between said component and said overlay coating,

said coating being particularly resistant to sulphidation corrosion of the type experienced at 750° C., said coating having a composition consisting essentially of, in weight percent:

chromium: 30 to 40

titanium: 1 to 5

aluminum: 2 to 10

remainder selected from the group consisting of nickel, cobalt and nickel plus cobalt, and

said intermediate layer not exceeding 25 μm of a metal selected from the group consisting of platinum, rhodium and nickel.

4,530,886

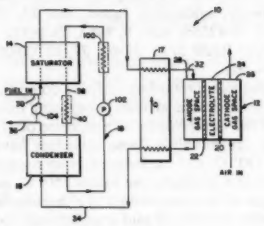
PROCESS FOR HUMIDIFYING A GASEOUS FUEL STREAM

Richard A. Sederquist, Newington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 6, 1984, Ser. No. 678,612

Int. Cl.³ H01M 8/04

U.S. Cl. 429—13 5 Claims



1. In a process for operating a fuel cell powerplant, the powerplant comprising a fuel cell stack including anode gas compartments and cathode gas compartments, wherein a gas stream comprising a gaseous fuel for the stack requires humidification, the steps of:

(a) passing the gas stream requiring humidification through a saturator;

(b) directing the humidified gas stream from the saturator into and through the anode gas compartments of the stack;

(c) directing at least a portion of the exhaust from the anode gas compartments through a condenser;

(d) circulating a mass of liquid water, in a loop, alternately through the saturator of step (a) and the condenser of step (c) in direct contact with the gas streams passing therethrough, the liquid water cooling the gas stream within the condenser and causing condensation of a portion of the water vapor therein, which condensate is picked up by the circulating water stream along with sensible heat and the heat of condensation given up by the gas stream in the condenser, wherein as the heated liquid water stream from the condenser passes through the saturator, a portion of the liquid water evaporates into the gas stream within the saturator to provide all the water vapor necessary to humidify the gas stream to the level required, substantially all of the heat of vaporization in the saturator being provided by the heat of condensation transferred from the anode exhaust gas stream to the circulating liquid water stream in the condenser.

4,530,887

FUEL CELL SYSTEM WITH ELECTROLYTE CONSERVATION AND/OR REPLENISHMENT

Hansraj C. Maru, Brookfield, and Mohammad Farooque, Huntington, both of Conn., assignors to Energy Research Corporation, Danbury, Conn.

Filed Jun. 6, 1984, Ser. No. 617,900

Int. Cl.³ H01M 8/14

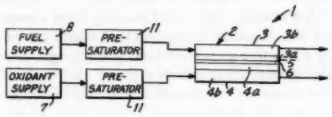
U.S. Cl. 429—16 32 Claims

1. A fuel cell system comprising:

a fuel cell operating at a predetermined temperature and including: an electrode adapted to communicate with an

electrolyte; and a passage means for carrying a process gas through said cell in communication with said electrode; and means for providing said process gas to said passage means at a preselected temperature, said process gas including a preselected amount of a preselected constituent, said temperature, constituent and amount of constituent being selected to retard electrolyte from being carried from said cell when said gas traverses said cell through said passage means.

17. A method for use with a fuel cell system comprising the steps of:



operating a fuel cell at a predetermined temperature;

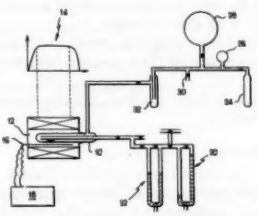
providing process gas to a passage means which is in communication with an electrode of the fuel cell, said electrode being adapted to communicate with an electrolyte, and said process gas being at a preselected temperature and including a preselected amount of preselected constituent, said temperature, constituent and amount of constituent being selected to retard electrolyte from being carried from said cell when said gas traverses said cell through said gas passage means.

4,530,888

BATTERY WITH GRAPHITE-MANGANESE CHLORIDE INSERTION COMPOUND

Francis Baron, Begles; Serge Flandrois, Pessac, and Adolphe Pacault, Talence, all of France, assignors to Centre National de la Recherche Scientifique, Paris, France

Filed May 2, 1983, Ser. No. 490,569
Claims priority, application France, May 4, 1982, 82 07736
Int. Cl.³ H01M *6/04*
U.S. Cl. 429—206 **3 Claims**



1. In an electrochemical battery comprising a cathode, an anode and an aqueous electrolyte, the improvement wherein said cathode comprises an insertion compound of graphite with manganese chloride of the formula:

$$C_xMnCl_y$$

in which:

$x=5.6\pm0.1$ and
$y=2.4\pm0.1$.

4,530,889

ACIDIFIED POWDERED INTERLEAVING

Paul F. Duffer, Creighton; Helmut Franz, Pittsburgh, and Joseph D. Kelly, Chewick, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 28, 1981, Ser. No. 229,208
Int. Cl.³ B32B *23/00, 17/08, 15/00*
U.S. Cl. 428—326 **9 Claims**

4. A method for reducing the incidence of staining on the surface of stacked glass sheets comprising the steps of:

a. impregnating a porous powdered interleaving material with a strong organic acid which is an organotin halide; and

b. dispersing said acid treated interleaving material between said glass sheets prior to stacking.

4,530,890

ELECTRODE COATING COMPOSED OF COPOLYMERS DERIVED FROM DIACETONE ACRYLAMIDE

Guy Rampel, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.

Continuation of Ser. No. 244,789, Mar. 17, 1981, Pat. No. 4,407,913, which is a continuation of Ser. No. 157,313, Jun. 9, 1980, Pat. No. 4,298,667, which is a division of Ser. No. 966,745, Dec. 5, 1978, Pat. No. 4,245,016. This application Aug. 22, 1983, Ser. No. 525,298
The portion of the term of this patent subsequent to Jan. 13, 1998, has been disclaimed.
Int. Cl.³ H01M *4/62*
U.S. Cl. 429—217 **8 Claims**

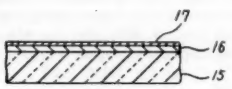
1. An electrode comprising a substrate, a finely divided active electrode material, and a copolymer derived from diacetone acrylamide and a polymerizable monomer.

4,530,891

PHOTO-MASK BLANK FOR USE IN LITHOGRAPHY INCLUDING A MODIFIED CHROMIUM COMPOUND

Osamu Nagarekawa, and Shigekazu Matsui, both of Yamanashi, Japan, assignors to Hoya Electronics Co., Ltd., Yamanashi, Japan

Continuation of Ser. No. 357,878, Mar. 15, 1982, abandoned. This application Dec. 29, 1983, Ser. No. 550,006
Int. Cl.³ G03F *9/00*
U.S. Cl. 430—5 **20 Claims**

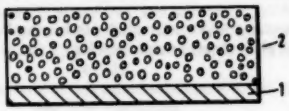


1. A photo-mask blank for use in lithography comprising a substrate transparent to light in a predetermined wavelength region and having a principal surface, a shading layer on said principal surface which includes chromium and chromium carbide for shading the light in said predetermined wavelength region, and an antireflection layer overlaid on said shading layer which includes chromium oxide and chromium nitride for reducing reflection of the light in at least a part of said predetermined wavelength region.

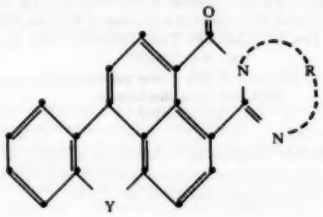
4,530,892
ELECTROPHOTOGRAPHIC RECORDING MATERIAL FOR PRINTING FORMS

Wolfgang Wiedemann, Geisenheim-Johannisberg, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 21, 1983, Ser. No. 477,383
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1982, 3210576
Int. Cl.³ G03G 5/06
U.S. Cl. 430—78 **10 Claims**



1. An electrophotographic recording material adapted for the manufacture of printing forms and printed circuits, comprising an electrically conducting support member; and a photoconductive insulating coating which is readily soluble in an alkaline medium and which comprises (i) a binder and (ii) a dye dispersed in said binder, which dye comprises a compound having the formula



(II)

in which

Y is an oxygen atom, or a sulfur atom, and

R is a phenyl or naphthyl radical which is unsubstituted or substituted by nitro, or by alkyl, alkoxy or alkylcarboxy groups having 1 to 4 carbon atoms, or by halogen.

4,530,893
ONE-COMPONENT TYPE RED COLOR MAGNETIC DEVELOPER

Kouji Maekawa, Kyoto, and Nobuhiro Miyakawa, Abiko, both of Japan, assignors to Mita Industrial Co. Ltd., Osaka, Japan

Filed Nov. 29, 1983, Ser. No. 556,193
Claims priority, application Japan, Nov. 30, 1982, 57-208690
Int. Cl.³ G03G 9/08
U.S. Cl. 430—106 **9 Claims**

1. A one-component type red color magnetic developer having a self-electroscopic property, which comprises particles prepared by pulverizing a kneaded composition comprising 100 parts by weight of a magnetic powder composed mainly of ocherous gamma-type diiron trioxide having a number average particle size of 0.2 to 2 microns, 10 to 20 parts by weight of a red azo pigment and 40 to 200 parts by weight of a binder resin, wherein when a fixed image of the particles is measured by a color difference meter, the value x is from 0.51 to 0.73, the value y is from 0.22 to 0.40 and the value Y is from 5 to 65%.

4,530,894
COATED MAGNETIC TONER POWDER

Tetsuya Imamura; Takashi Takeuchi; Takashi Tetsutani, all of Utsunomiya, and Shinichiro Yasuda, Wakayama, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Apr. 20, 1984, Ser. No. 602,587
Claims priority, application Japan, Apr. 28, 1983, 58-75321; Apr. 28, 1983, 58-75324; Apr. 28, 1983, 58-75325
Int. Cl.³ G03G 9/14
U.S. Cl. 430—106.6 **7 Claims**

1. A magnetic toner comprising a homogeneous dispersion of a magnetic powder in a resin or wax effective as a binder for said powder, the particles of said magnetic powder being coated with a coating layer, said coating layer comprising the product of the reaction between (1) a silane coupling agent containing a reactive group selected from the group consisting of an amino group, an isocyanate group and an epoxy group, with (2) one or more compounds containing a functional group that is reactive with said reactive group of said silane coupling agent, wherein

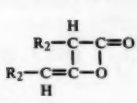
(a) when said silane coupling agent (1) contains an amino group, said compound (2) is selected from the group consisting of

I. higher fatty acids having 8 to 22 carbon atoms, homopolymers and copolymers of α,β-unsaturated carboxylic acids, copolymers containing α,β-unsaturated carboxylic acids,

II. acid anhydrides having 4 to 32 carbon atoms, polymers of maleic anhydride, copolymers containing maleic anhydride,

III. diphenylmethane diisocyanate, tolylene diisocyanate, hexamethylene diisocyanate, compounds having a terminal isocyano group derived from polytetramethylene glycol and diphenylmethane diisocyanate, compounds having a terminal isocyanato group derived from 1 mol of an ester having a terminal hydroxyl group obtained from 1,4-butanediol and adipic acid and 2 mols of tolylene diisocyanate, compounds having three isocyanato groups derived from 1 mol of trimethylolpropane and 3 mols of diphenylmethane diisocyanate, and compounds having four isocyanato groups derived from 1 mol of pentaerythritol and 4 mols of tolylene diisocyanate, and

IV. ketene dimers having the following formula:



wherein R_1 and R_2 each represent a hydrocarbon group having 4 to 24 carbon atoms,

(b) when said silane coupling agent contains an isocyanate group, said compound (2) is selected from the group consisting of

V. higher alcohols having 8 to 22 carbon atoms, phosphates of the formula:

$$(RO)_l PO(OH)_{3-l}$$

wherein R represents an alkyl or alkenyl group and l represents a number of 1, 1.5 or 2,
phosphates of the formula:

$$[RO(AO)_n]_l PO(OH)_{3-l}$$

wherein R and l have the same meanings as defined above, A represents an alkylene group having 2 to 4 carbon atoms, and n represents an integer of 1 to 30,
phosphates of the formula:

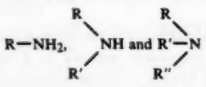
$$[RCOO(AO)_n]_l PO(OH)_{3-l}$$

wherein R, A, l and n having the same meanings as defined above,

partial esters of polyhydric alcohols with fatty acids, homopolymers and copolymers of monomers having a copolymeriable double bond and a hydroxyl group in the molecule,

copolymers containing a monomer unit having a copolymerizable double bond and a hydroxyl group in the molecule,

VI. primary, secondary and tertiary amines of the formulae:



wherein R, R′ and R″ each represent an alkyl group, polyalkylenepolyamines,

VII. higher fatty acids having 8 to 32 carbon atoms, homopolymers of a vinyl monomer having a carboxyl group, copolymers containing a vinyl monomer having a carboxyl group, and

compounds having a terminal carboxyl group obtained from 1 mol of a diol and 2 mol of a dicarboxylic acid, and

(c) when said silane coupling agent contains an epoxy group, said compound (2) is selected from the group consisting of

VIII. higher alcohols having 8 to 22 carbon atoms,

IX. higher fatty acids having 8 to 32 carbon atoms, and

X. copolymers comprising 5 to 20 molar % of a di- or monoalkyl aminoalkyl acrylate or methacrylate and 50 to 95 molar % of a hydrophobic vinyl monomer.

4,530,895

AQUEOUS-ALKALINE SOLUTION AND PROCESS FOR DEVELOPING POSITIVE-WORKING REPRODUCTION LAYERS

Ulrich Simon, Mainz-Lerchenberg, and Rainer Beutel, Wiesbaden-Breckenheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

PCT No. PCT/EP83/00205, § 371 Date Apr. 11, 1984, § 102(e) Date Apr. 11, 1984, PCT Pub. No. WO84/00826, PCT Pub. Date Mar. 1, 1984

PCT Filed Aug. 3, 1983, Ser. No. 599,189

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1982, 3230171

Int. Cl.[3] **G03C** *5/18, 1/52, 5/00;* **G03F** *7/00*

U.S. Cl. 430—145 **14 Claims**

1. An aqueous-alkaline developer solution for radiation-sensitive, positive-working production layers, comprising (a) from 0.001 to 1.0 percent by weight of a tetraalkyl ammonium hydroxide comprising alkyl substituents which are identical or different and which comprise from 1 to 6 carbon atoms, or of a salt of said tetraalkylammonium hydroxide, and (b) from 5 to 15 percent by weight of an alkali metal silicate.

4,530,896

PHOTOSENSITIVE LAMINATE

Carl W. Christensen, and Calvin Isaacson, both of Beverly, Mass., assignors to Shipley Company Inc., Newton, Mass.

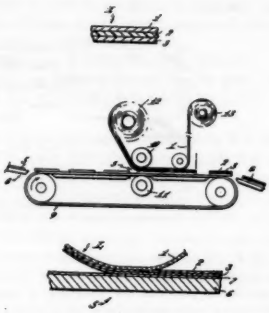
Continuation of Ser. No. 16,145, Mar. 3, 1970, abandoned. This application May 16, 1972, Ser. No. 253,865

Int. Cl.[3] **G03C** *1/52, 1/90;* **G03F** *7/26*

U.S. Cl. 430—155 **23 Claims**

1. A composite consisting of a light sensitive laminate adhered to a substrate, said light sensitive laminate comprising an unexposed and undeveloped light-sensitive layer of a photoresist material, a support layer therefore, and an intermediate protective layer between said light-sensitive layer and said support layer, said intermediate layer being optically transmitting and soluble in developer for said light sensitive layer, said light-sensitive layer being firmly adhered to said intermediate layer and to said substrate and said support layer being loosely adhered to said intermediate layer relative to said light-sensitive layer.

12. Light sensitive transfer material comprising a support, a light sensitive layer free of photographic silver halide emulsion and a thin intermediate release layer of low permeability to the oxygen of the air, which does not become tacky when heated at a temperature of 150° C. and has a greater adhesion to said light sensitive layer than to said support.



21. A process for the production of a copy on a support which comprises laminating the support, with heating, to a free surface of a thermoplastic light-sensitive layer on a temporary support, stripping said temporary support, and image-wise exposing and developing said light-sensitive layer, said light-sensitive layer and temporary support having a thin intermediate release layer of low permeability to the oxygen of the air which does not become tacky when heated at temperatures up to 150° C. and has a greater adhesion to said light-sensitive layer than to said support.

4,530,897

PROCESS FOR DESENSITIZING DIAZO LITHOGRAPHIC PRINTING FORMS USING DESENSITIZING SOLUTION WITH LIGHT ABSORBING COMPOUND

Günter Berghaeuser, Wiesbaden; Loni Schell, Hofheim, and Werner Frass, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 397,092, Jul. 12, 1982, abandoned. This application Nov. 2, 1983, Ser. No. 547,465

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1981, 3127668

Int. Cl.[3] **G03F** *7/08*

U.S. Cl. 430—302 **3 Claims**

1. A process for desensitizing lithographic printing forms based on light-hardened diazo compounds selected from the group consisting of diazonium salt condensation product and p-quinone diazides and which forms are ready for printing, said process comprising treating a lithographic printing form with an aqueous desensitizing solution and then drying the printing form,

said aqueous solution comprising an admixture of about 4 to 40 percent, relative to the weight of said solution, of a water-soluble, film-forming, high molecular weight organic compound selected from the group consisting of gum arabic, dextrin, polyvinyl alcohol and a water-soluble acrylamide polymer,

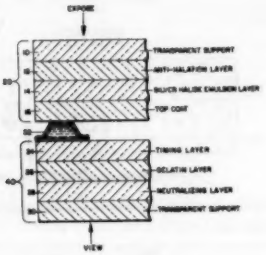
and about 0.1 to 10 percent, relative to the weight of said solution, of a compound having a high absorption of light in the spectral region of 300 to 450 nm and being selected from the group consisting of pyrazoline derivatives, 2-chloro-3-methyl-2-pyrone-6-(phenyl-4-sulfonic acid) or a salt thereof, and quinoline derivatives.

4,530,898

PHOTOGRAPHIC PRODUCTS AND PROCESSES PROVIDING A NEGATIVE IMAGE

Arnold Spiegal, Sharon, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 29, 1984, Ser. No. 584,724
Int. Cl.³ G03C *1/48, 5/26, 5/38, 5/39*
U.S. Cl. 430—403 **14 Claims**



1. A photographic process for forming a negative image comprising exposing a photosensitive sheet-like element comprising a transparent support carrying a layer containing a negative working gelatino silver halide emulsion, to form a latent image in exposed silver halide, distributing an aqueous alkaline processing fluid between said exposed photosensitive element and a superposed spreader sheet, developing said exposed silver halide to high covering power silver and reducing to low covering power silver at least 75% of the unexposed silver halide, whereby a visible negative image is formed in said silver halide emulsion layer.

4,530,899

COLOR PHOTOGRAPHIC MATERIALS WITH PHENOL OR NAPHTHOL RING COMPOUND HAVING SULFOAMIDO GROUP

Nobutaka Ohki; Nobuo Furutachi, and Yoshinobu Yoshida, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 18, 1984, Ser. No. 601,760
Claims priority, application Japan, Apr. 19, 1983, 58-68878
Int. Cl.³ G03C *1/06, 7/00, 7/34*
U.S. Cl. 430—551 **11 Claims**

1. A silver halide color photographic material comprising a support and at least one silver halide emulsion layer on the support, said photographic material contains at least one compound selected from the group consisting of a substantially colorless phenol or naphthol derivative having a group which is not released by the displacement of the oxidation product of an aromatic primary amine at the 4-position of the phenol ring or the naphthol ring of the derivative and at least one sulfonamido group and at least one group selected from the group consisting of a sulfonamido group, an acylamino group, and a sulfonyl group at other positions of the phenol or naphthol ring.

4,530,900

SOLUBLE INSOLUBLE POLYMERS IN ENZYMEIMMUNOASSAY

David L. Marshall, Carmel, Ind., assignor to Seragen Diagnostics Inc., Indianapolis, Ind.

Filed Sep. 13, 1982, Ser. No. 417,281
Int. Cl.³ G01N *33/54;* **C12N** *9/96*
U.S. Cl. 435—7 **11 Claims**

1. A method for determining the presence of a soluble antigen in a test solution which comprises in sequence:

(a) allowing a soluble antibody-polymeric substance conjugate to react with the soluble antigen and a soluble antigen-enzyme conjugate in the test solution, said antibody being the reactive complement to said soluble antigen and to the antigen moiety of the antigen-enzyme conjugate thereby to form a reaction product containing said polymeric substance;

(b) causing the reaction product containing the polymeric substance to precipitate and separating the solid formed thereby from the test solution;

(c) resolubilizing the reaction product containing the polymeric substance to form a second test solution;

(d) adding a substrate for the enzyme to said second test solution; and

(e) measuring the enzymatic activity in the second test solution compared to the enzymatic activity in a medium derived from a solution having a known amount of antigen.

4,530,901

RECOMBINANT DNA MOLECULES AND THEIR USE IN PRODUCING HUMAN INTERFERON-LIKE POLYPEPTIDES

Charles Weissmann, Zurich, Switzerland, assignor to Biogen N.V., Curacao, Netherlands Antilles

Filed Feb. 4, 1980, Ser. No. 118,084
Claims priority, application European Pat. Off., Jan. 8, 1980, 80.300079.3
Int. Cl.³ C12P *21/02, 21/00, 19/34;* **C12N** *15/00;* **C12R** *1/19;* **C07H** *21/04;* **C12N** *5/00, 5/02, 1/20, 1/00*
U.S. Cl. 435—70 **18 Claims**

1. A recombinant DNA molecule consisting of segments of DNA from different genomes which have been joined end-to-end outside of living cells and which have the capacity to infect some host and to be maintained therein, and the progeny thereof, comprising a DNA sequence selected from the group consisting of:

(a) the DNA inserts of Z-pBR322(Pst)/HcIF-2h (DSM 1700), Z-pBR322(Pst)/HcIF-SN35 (DSM 1701), Z-pBR322(Pst)/HcIF-SN42 (DSM 1702) and Z-pKT287(Pst)/HcIF-2h-AH6 (DSM 1703),

(b) DNA sequences which hybridize to any of the foregoing DNA inserts and which code on expression for a polypeptide of the IFN-α type, and

(c) DNA sequences which code on expression for a polypeptide of the IFN-α type coded for on expression by any of the foregoing DNA sequences and inserts,

said DNA sequences and inserts being operatively linked to an expression control sequence in said recombinant DNA molecule.

4,530,902

METHOD FOR PRODUCING FRUCTOSE-1,6-DIPHOSPHORIC ACID

Giulio C. Perri, Milan; Tommaso Bianco, Pomezia, and Beniamino Piccirilli, Belluno, all of Italy, assignors to Biomedica Foscama Industria Chimico Farmaceutica S.p.A., Rome, Italy

Filed Sep. 28, 1979, Ser. No. 80,016
Claims priority, application Italy, Jan. 16, 1979, 47658 A/79
Int. Cl.³ C07H *11/04*
U.S. Cl. 435—105 **4 Claims**

1. A process for the production of an iron salt of the fructose-1,6-diphosphate having the formula $(FDP)_3Fe_4$ comprising the steps of:

(a) adding to a fermentation broth which contains FDP a ferric salt in a stoichiometrical amount and an alkali until attaining a pH comprised within the range 1.8–2;

(b) washing the precipitate obtained from (a) with water until the alkali metal salt is discharged, and

(c) either drying or freezing.

4,530,903

L-2-HYDROXY-4-METHYLPENTANOIC ACID-DEHYDROGENASE, PROCESS FOR OBTAINING IT AND ITS USE

Wolfgang Leuchtenberger, Bruchköbel; Maria-Regina Kula, Wolfenbüttel; Werner Hummel, Braunschweig, and Horst Schütte, Salzgitter, all of Fed. Rep. of Germany, assignors to Degussa Aktiengelleschaft, Frankfurt, Fed. Rep. of Germany

Filed Sep. 13, 1983, Ser. No. 531,725

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1982, 3234022

Int. Cl.[3] C12P *11/00, 7/40;* C12N *9/04;* C12R *1/225*

U.S. Cl. 435—130 7 Claims

1. The enzyme L-2-hydroxy-4-methylpentanoic acid-dehydrogenase having the following properties:

(a) specific activity against L-2-hydroxy-4-methylpentanoic acid,

(b) dependent from nicotinamide-adenine-dinucleotide (NAD),

(c) temperature-optimum of the activity 40° to 60° C.,

(d) temperature-optimum of the stability ≦40° C.,

(e) pH-optimum for the dehydrogenation reaction 8.0 to 8.5,

(f) pH-optimum for the reduction reaction around 7.0,

(g) pH stability region 6.5 to 8.5,

(h) Michaelis constant (K_M value) against L-2-hydroxy-4-methylpentanoic acid 0.62×10^{-3}M, and

(i) additional activity against L-2-hydroxypentanoic acid, L-2-hydroxyhexanoic acid, and L-2-hydroxy-4-(methylmercapto)-butyric acid.

4. A process of enzymatically converting L-2-hydroxy-4-methylpentanoic acid, L-2-hydroxypentanoic acid, L-2-hydroxyhexanoic acid, or L-2-hydroxy-4-(methylmercapto)-butyric acid into the corresponding ketocarboxylic acid comprising treating the hydroxy carboxylic acid with the enzyme of claim 1 together with a coenzyme for such reaction.

4,530,904

METHOD FOR CONFERRING BACTERIOPHAGE RESISTANCE TO BACTERIA

Charles L. Hershberger, New Palestine, and Paul R. Rosteck, Jr., Beech Grove, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 3, 1982, Ser. No. 414,290

Int. Cl.[3] C12P *19/34, 21/00, 21/02, 21/04;* C12N *1/20, 1/00, 15/00*

U.S. Cl. 435—172.3 27 Claims

1. A method for protecting a bacterium from a bacteriophage comprising

(a) transforming said bacterium with a recombinant DNA cloning vector, said vector comprising

(1) a DNA segment that confers a restriction and cognate modification activity to said bacterium,

(2) a replicon that is functional in said bacterium, and

(3) a gene that expresses a functional polypeptide in said bacterium, and

(b) culturing said transformed bacterium under large-scale fermentation conditions subject to the limitation that (1) said bacteriophage is free living in the environment and capable of infecting large-scale bacterial fermentations and contains double stranded DNA with a restriction site of the same specificity as the restrictions activity conferred to said bacterium, and (2) that said modification activity is expressed in said bacterium prior to said restriction activity.

4,530,905

CROSSLINKED GELATIN FOAMS

Harold H. Freedman, Wayland, Mass., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 25, 1984, Ser. No. 664,664

Int. Cl.[3] C09H *7/00;* C07G *7/02;* C08H *1/06;* C12N *11/06*

U.S. Cl. 435—177 10 Claims

1. A process for providing stable, water-swellable, essentially water-insoluble foam wherein a polyisocyanate is contacted with an aqueous liquid comprising a gelatin which is at a specific pH and which is subjected to a sufficiently high rate of shear agitation.

4,530,906

MICROBIAL RENNET HAVING INCREASED MILK COAGULATING ACTIVITY AND METHOD AND METHOD FOR PRODUCTION THEREOF

Toshihiko Higashi, Hachioji; Yoshinori Kobayashi, and Shinjiro Iwasaki, both of Hino, all of Japan, assignors to Meito Sangyo Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 5, 1983, Ser. No. 482,171

Claims priority, application Japan, Apr. 8, 1982, 57-57211

Int. Cl.[3] C12N *9/58, 9/96;* C12R *1/785*

U.S. Cl. 435—223 5 Claims

5. Improved microbial rennet having a low PA/MCA index and a high MCA index and obtained by acylating a microbial rennet from *Mucor pusillus* microorganisms with succinic anhydride, said improved microbial rennet having a proteolytic activity (PA)/milk coagulating activity (MCA) index of 50 to 90 when the PA/MCA ratio of untreated microbial rennet before the acylation is taken as 100, and an MCA index of more than 100 when the MCA of the untreated microbial rennet is taken as 100.

4,530,907

PERFUSION-CULTIVATION OF ANIMAL CELLS AND EQUIPMENT THEREFOR

Anders Peterson, Petrusstugan, Askartorp, 150 11 Björnlunda, and Erik Walum, Knipvägen 57, 184 00 Åkersberga, both of Sweden

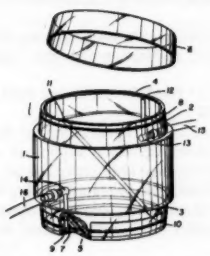
PCT No. PCT/SE82/00050, § 371 Date Nov. 10, 1982, § 102(e) Date Nov. 10, 1982, PCT Pub. No. WO82/03227, PCT Pub. Date Sep. 30, 1982

PCT Filed Feb. 19, 1982, Ser. No. 448,996

Claims priority, application Sweden, Mar. 12, 1981, 8101564

Int. Cl.[3] C12N *5/00;* C12M *3/04, 1/22*

U.S. Cl. 435—240 14 Claims



1. Apparatus for perfusion-cultivation of at least one cell culture of human or animal origin, comprising a cylindrical body terminating at least one end in a truncated conical body having an end surface recessed from the end of said truncated conical body, means extending through said cylindrical body and through the periphery of said end surface for supplying a nutrient medium to the cell culture, and means connected through said cylindrical body and through the opposite periphery of said end surface for removal of the nutrient medium from the cell culture, whereby the cell culture is subjected to a substantially laminar flow of medium, wherein

said truncated cone being configured to directly recive a cell culturing dish having an inner diameter substantially the same as the outer diameter of said truncated cone thus forming a cell culturing chamber bounded by the bottom surface of the dish, the recessed end surface of said truncated cone, and the inner walls of the cone.

4,530,908

DIAGNOSIS AND TREATMENT OF FLUKE INFECTIONS WITH MONOCLONAL ANTIBODIES

Mette Strand, Baltimore, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Division of Ser. No. 297,290, Aug. 28, 1981, Pat. No. 4,416,866.
This application Apr. 27, 1983, Ser. No. 489,004
Int. Cl.³ G01N *33/48, 33/56;* C12N *15/00*
U.S. Cl. 436—536 17 Claims

3. An in vitro diagnostic method for the determination of an active fluke infection in a warm-blooded animal comprising providing a sample of body fluid from a warm-blooded animal and testing said sample for the presence of fluke spine glycoprotein.

4,530,909

ALUMINOSILICATE GLASS CONTAINING Y_2O_3 CONCENTRATE AND ZRO_2

Akio Makishima, Sakura; Tatsuya Nagata, Tokoname, and Takajiro Shimohira, Ryugasaki, all of Japan, assignors to National Institute for Researches in Inorganic Materials, Ibaraki, Japan

Continuation of Ser. No. 532,976, Sep. 16, 1983, abandoned. This application Oct. 19, 1984, Ser. No. 662,832
Claims priority, application Japan, Oct. 14, 1982, 57-180498
Int. Cl.³ C03C *3/04*
U.S. Cl. 501—73 2 Claims

1. An aluminosilicate glass consisting of 30 to 60 molar % of SiO_2, 20 to 35 molar % of Al_2O_3, 10 to 30 molar % of an yttrium concentrate composed essentially of Y_2O_3 and the rare earth oxides present in a crude ore of Y_2O_3, the concentrate being composed mainly of Y_2O_3, and 5–8 molar % of ZrO_2.

4,530,910

REGENERATION OF THE AL_2O_3 CARRIER MATERIAL OF A SPENT AG/AL_2O_3 SUPPORTED CATALYSTS

Wolf D. Mross, Frankenthal; Matthias Schwarzmann, Limburgerhof; Juergen Plueckham, Frankenthal, and Juergen Dehler, Neuhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 20, 1983, Ser. No. 543,822
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1982, 3239886
Int. Cl.³ B01J *21/20, 23/96;* C07D *301/10*
U.S. Cl. 502—24 8 Claims

1. A process for the regeneration of the α-Al_2O_3 carrier material of a spent Ag/Al_2O_3 supported catalyst which remains after conventional removal of the silver from said spent catalyst, the spent Ag/Al_2O_3 catalyst being that obtained in the catalytic preparation of ethylene oxide by an addition reaction of oxygen with ethylene in the gas phase, which process comprises:

(a) treating said remaining carrier material after removal of the silver with an aqueous solution of a water-soluble salt or hydroxide of a metal of group IIA, IIIB or IVB of the Periodic Table or of aluminum, copper, manganese, zinc, cadmium, tin or lead;

(b) then drying the material as treated in step (a); and

(c) and coating the dried material with the catalytic silver and an alkali metal dopant.

6. A process as claimed in claim 1 using a calcium hydroxide solution in the treatment step (a).

8. A process for the regeneration of the α-Al_2O_3 carrier material of a spent Ag/Al_2O_3 supported catalyst which remains after conventional removal of the silver from said spent catalyst, the spent Ag/Al_2O_3 catalyst being that obtained in the catalytic preparation of ethylene oxide by an addition reaction of oxygen with ethylene in the gas phase, which process comprises:

heating said remaining carrier material after removal of the silver at 750°–1,500° C. for not less than 10 minutes; and coating the heated material with the catalytic silver and an alkali metal dopant.

4,530,911

HYDRODENITRIFICATION CATALYST

Robert C. Ryan; Charles T. Adams, both of Houston, and Don M. Washecheck, Katy, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 18, 1984, Ser. No. 611,574
Int. Cl.³ B01J *29/06, 27/18*
U.S. Cl. 502—74 21 Claims

1. A method for preparing supported hydroconversion catalysts containing one each of molybdenum or tungsten and of cobalt and/or nickel incorporated into a suitable support which comprises: (a) preparing an aqueous impregnating solution having a pH in the range of about 0.7–2.7 comprising mixing at least one each of a compound of molybdenum or tungsten and of cobalt and/or nickel, a stabilizing amount of from about 0.2–1.0 mole of phosphorus per mole of Mo or W and from about 2–6%w, basis support, of a suitable soluble amine compound; (b) impregnating a suitable catalyst support with said solution; and (c) drying and calcining the composite.

4,530,912

POLYMERIZATION CATALYST AND METHOD

Thomas J. Pullukat, Hoffman Estates, and Raymond E. Hoff, Palatine, both of Ill., assignors to Chemplex Company, Rolling Meadows, Ill.

Filed Jun. 4, 1981, Ser. No. 270,410
Int. Cl.³ C08F *4/02*
U.S. Cl. 502—104 34 Claims

21. The method of making a solid catalyst for use with an alkyl or aryl aluminum cocatalyst in the polymerization and copolymerization of 1-olefins, comprising:

(1) reacting a multifunctional organic silicon compound of the formula $RSiX_3$ with silica or alumina or a mixture having surface hydroxyl groups, where R is a hydrocarbon group of 1 to about 10 carbon atoms and X is a group chemically reactive with said surface hydroxyl groups selected from the group consisting of $—OR^1$, $—N(R^1)_2$, $—N(H)SiR_3^1$, $—OCH_2CH_2OR^1$, $—O_2CR^1$, or mixtures, where R^1 is a hydrocarbon group of 1 to about 10 carbon atoms;

(2) reacting the product of step (1) with a halide or alkoxide of a Group IVB or VB transition metal or mixture of these; and

(3) reacting the product of step (2) with a Group IIA organometallic compound; or

(2′) reacting the product of step (1) with a Group IIA organometallic compound; and

(3′) reacting the product of step (2′) with a halide or alkoxide of a Group IVB or VB transition metal or mixture thereof.

4,530,913

POLYMERIZATION CATALYST AND METHOD

Thomas J. Pullukat, Hoffman Estates, and Raymond E. Hoff, Palatine, both of Ill., assignors to Chemplex Company, Rolling Meadows, Ill.

Filed Jan. 16, 1980, Ser. No. 112,560
Int. Cl.³ C08F *4/64, 4/68*
U.S. Cl. 502—104 44 Claims

20. The method of making a solid catalyst for use with an alkyl or aryl aluminum compound cocatalyst in the polymerization and copolymerization of 1-olefins by: (1) reacting a halogen free monofunctional organic silicon compound with silica or alumina having surface hydroxyl groups or a mixture thereof, said silicon compound being reactive with said surface hydroxyl groups; (2) reacting the product of (1) with a Group IIA organometallic compound, or complex of an alkyl aluminum compound, of magnesium or calcium; and (3) reacting the

product of (2) with a halide or alkoxide of titanium, vanadium, zirconium or mixtures of these; or (2') reacting the product of (1) with an alkyl aluminum halide and a Group IIA organometallic compound, or complex of an alkyl aluminum compound, of magnesium or calcium prior to (3); or (1') reacting the product of (1) with the halide or alkoxide of (3) prior to (2).

4,530,914

PROCESS AND CATALYST FOR PRODUCING POLYETHYLENE HAVING A BROAD MOLECULAR WEIGHT DISTRIBUTION

John A. Ewen, and Howard C. Welborn, Jr., both of Houston, Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 6, 1983, Ser. No. 501,740
Int. Cl.[3] C08F *4/64, 4/68, 4/62*
U.S. Cl. 502—113 7 Claims

1. A catalyst system for the (co)polymerization of ethylene to polyethylene having a broad molecular weight distribution, said catalyst comprising (a) at least two different metallocenes selected from mono, di or tricyclopentadienyls and substituted cyclopentadienyls of a Group 4b, 5b and 6b transition metal each having different propagation and termination rate constants of ethylene polymerizations and (b) an alumoxane.

4,530,915

CATALYST PREPARED FROM ORGANOMAGNESIUM COMPOUND, CARBON DIOXIDE COMPOUND, REDUCING HALIDE SOURCE AND TRANSITION METAL COMPOUND

Calvin P. Esneault; Ricardo Fuentes, Jr., and Larry A. Meiske, all of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 416,540, Sep. 9, 1982, abandoned. This application Jan. 25, 1984, Ser. No. 573,891
Int. Cl.[3] C08F *4/64*
U.S. Cl. 502—115 10 Claims

1. A catalytic product resulting from admixing in an inert hydrocarbon diluent and in an atmosphere which excludes moisture and oxygen

(A) at least one hydrocarbon soluble organomagnesium material;

(B) essentially anhydrous carbon dioxide;

(C) at least one reducing halide (X) source; and

(D) at least one transition metal (Tm) compound; and wherein

(1) the components are added in the order (A), (B), (C) and (D) or (A), (B), (D) and (C); and

(2) the components are employed in quantities so as to provide the following atomic ratios

Mg:Tm of from about 4:1 to about 100:1;

X:Mg of from about 2:1 to about 20:1; and

CO_2:Mg (M ratio of CO_2:atoms of Mg) of from about 1:1 to about 2:1.

4,530,916

CATALYST FOR USE IN A METHACRYLIC ACID PROCESS

Mutsumi Matsumoto, and Hideki Sugi, both of Takasaki, Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 95,668, Nov. 19, 1979, Pat. No. 4,467,113. This application Nov. 28, 1983, Ser. No. 555,674
Claims priority, application Japan, Dec. 13, 1978, 53-153158
Int. Cl.[3] B01J *27/14, 21/02*
U.S. Cl. 502—209 3 Claims

1. A catalyst having heteropoly-acid structure and the general formula:

$$Mo_aV_bP_cCu_dAs_eX_fO_g$$

wherein Mo, V, P, Cu, As and O represent respectively molybdenum, vanadium, phosphorus, copper, arsenic and oxygen, X represents one or more elements selected from the group consisting of tin, lead, cerium, cobalt, iron, zirconium, thorium, tungsten, germanium, nickel, rhenium, bismuth, antimony, chromium, boron, magnesium, silver, aluminum, zinc and titanium and a, b, c, d, e, f and g represent the atomic ratio of the elements where,

a is 10,

b is a number of 3 or less than 3 excluding 0,

c is a number of 0.5 to 6,

d is a number of 3 or less than 3 excluding 0,

e is a number of 3 or less than 3 excluding 0,

f is a number of 0 to 3,

g is a number determined depending on the valency and atomic ratio of other elements.

4,530,917

PROCESS OF PRESULFURIZING CATALYSTS FOR HYDROCARBONS TREATMENT

Georges Berrebi, Valence, France, assignor to Eurecat - Societe Europeenne de Retraitement de Catalyseurs, La Voulte sur Rhone, France

Filed Jan. 31, 1984, Ser. No. 575,597
Claims priority, application France, Jun. 30, 1983, 83 11048
Int. Cl.[3] B01J *27/02, 31/02, 37/00*
U.S. Cl. 502—220 11 Claims

1. A process for the treatment of a new or regenerated catalyst containing (a) a carrier on the basis of at least one metal or metalloid oxide and (b) at least one active metal, said process comprising treating the new or regenerated catalyst "ex situ", externally of a reaction zone, by means of at least one sulfuration agent introduced as a solution in an organic solvent, in the required amount, into the catalyst pores, said agent having the formula:

$$R—S_{(n)}—R'$$

wherein n is an integer from 3 to 20, and radicals R and R', identical or different, are each an organic radical containing 1 to 150 carbon atoms per molecule, said radicals being selected from saturated or unsaturated, linear or branched, alkyl radicals or radicals of the naphthenic type, aryl radicals, alkylaryl radicals and arylalkyl radicals, R' being alternatively a hydrogen atom.

4,530,918

CATALYSTS AND METHOD OF THEIR PREPARATION

Rodney M. Sambrook, Sheffield, and Julian R. H. Ross, Cleckheaton, both of England, assignors to Dyson Refractories Limited, England

Continuation of Ser. No. 283,793, Jul. 16, 1981, Pat. No. 4,469,815. This application Oct. 26, 1983, Ser. No. 545,521
Claims priority, application United Kingdom, Jul. 16, 1980, 8023224; Jul. 16, 1980, 8023226
Int. Cl.[3] B01J *21/04, 23/10, 23/76*
U.S. Cl. 502—303 23 Claims

1. A catalyst derived from a precursor having a layer structure and of the approximate chemical composition

$$Ni_6Al_xLa_y(CO_3)_{(x+y)/2}(OH)_{12+2(x+y)}nH_2O$$

in which x is not less than 1 and not greater than 4; y is not less than 0.05 and not greater than 1.5 and n is approximately 4; said precursor being formed from a solution of Ni, Al, and La nitrates by adding alkali to coprecipitate the precursor from the solution and maintaining the pH and temperature of the solution substantially constant during the precipitation; said precursor then being calcined and reduced to form the catalyst.

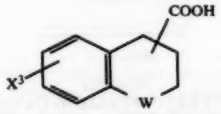
4,530,919

CARBOXYLIC ACID THERAPEUTIC AGENTS

John L. Belletire, Cincinnati, Ohio, assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 438,109, Nov. 1, 1982, , which is a division of Ser. No. 282,762, Jul. 13, 1981, Pat. No. 4,374,148, which is a division of Ser. No. 199,153, Oct. 21, 1980, Pat. No. 4,305,955.
This application Jan. 27, 1984, Ser. No. 574,765
Int. Cl.[3] C07C *3/34*
U.S. Cl. 562—467 **4 Claims**

1. A compound selected from the group consisting of 1,2,3,4-tetrahydronaphthalene carboxylic acids of the formula:



and the lower alkyl esters and unsubstituted amide derivatives thereof, and the base salts of said acids with pharmacologically acceptable cations, wherein X^3 is lower phenylalkoxy and W is $—CH_2—$ or $—CH(CH_3)—$.

4,530,920

NONAPEPTIDE AND DECAPEPTIDE ANALOGS OF LHRH, USEFUL AS LHRH AGONIST

John J. Nestor, San Jose, and Brian H. Vickery, Cupertino, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Nov. 7, 1983, Ser. No. 549,355
Int. Cl.[3] C07C *103/52*; A61K *37/02*
U.S. Cl. 514—15 **23 Claims**

1. A compound of the formula

(pyro)Glu-His-A-Ser-B-C-D-Ed-Pro-F (I)

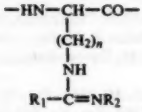
and the pharmaceutically acceptable salts thereof wherein:

A is tryptophyl, phenylalanyl, 3-(1-naphthyl)-L-alanyl or 3-(2-naphthyl)-L-alanine;

B is tyrosyl, phenylalanyl or 3-(1-pentafluorophenyl)-L-alanyl, ;

C is an amino acyl residue selected from the group consisting of the radicals represented by the following structural formulas:

(a)



(II)

wherein

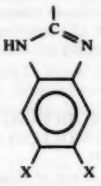
n is 1 to 5;

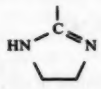
R_1 is alkyl of 1 to 12 carbon atoms, $-NRR_3$ wherein R is hydrogen or alkyl of 1 to 4 carbon atoms, R_3 is fluoroalkyl, alkyl of 1 to 12 carbon atoms, cycloalkyl, phenyl, benzyl, $—(CH_2)_n$-morpholino or $—(CH_2)_nN(R_4)_2$ wherein n is 1 to 5 and R_4 is lower alkyl;

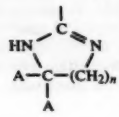
R_2 is hydrogen or R_3; or R_1 and R_2 comprise a ring represented by the following structural formulas:

IIA

-continued


IIB

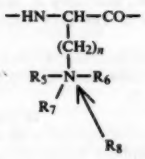

IIC



IID

wherein n is 1 to 7; A is hydrogen, alkyl of 1 to 6 carbon atoms or cycloalkyl; and X is halo or A or

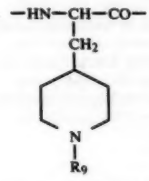
(b)



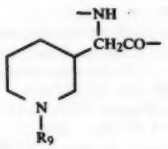
(III)

wherein R_5 is alkyl of 1 to 6 carbon atoms, benzyl, phenylethyl, cyclohexyl, cyclopentyl; and R_6, R_7 and R_8 are hydrogen or alkyl of 1 to 4 carbon atoms; and n is the integer 2–5; or

(c) a substituent of the formula



(IV)



(V)

wherein R_9 is hydrogen, alkyl of 1 to 12 carbon atoms, phenyl or phenylloweralkyl;

E is arginyl or leucyl: and

D is leucyl, isoleucyl, nor-leucyl or N-methylleucyl;

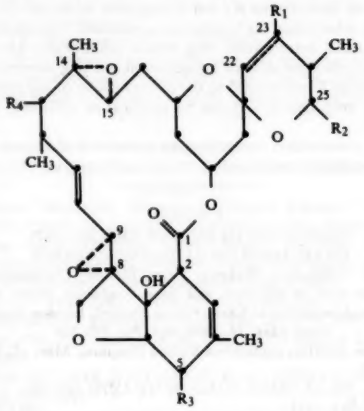
F is glycinamide or -NH-R^1, wherein R^1 is lower alkyl, cycloalkyl, fluoro lower alkyl or —NH—CO—NH—R^2 wherein R^2 is hydrogen or lower alkyl.

4,530,921
AVERMECTIN EPOXIDE DERIVATIVES AND METHOD OF USE

Helmut H. Mrozik, Matawan, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 3, 1983, Ser. No. 538,612
Int. Cl.[3] A61K 31/35, 31/71; C07H 17/08
U.S. Cl. 514—30 16 Claims

1. A compound having the formula:



wherein the broken line at the 22,23-position indicates a single or a double bond; wherein

R_1 is hydrogen or hydroxy provided that R_1 is present only when the broken line at the 22,23-position indicates a single bond;

R_2 is iso-propyl or sec-butyl;

R_3 is hydroxy or methoxy;

R_4 is hydroxy, α-L-oleandrosyloxy, or 4'-(α-L-oleandrosyl)-α-L-oleandrosyloxy; and the triangular figures at the 8,9 and 14,15 positions indicate that there is present a double bond or an epoxide, provided that at least one of the 8,9 and 14,15 positions is an epoxide.

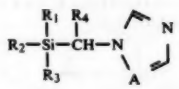
15. A method for the treatment of parasitic infections which comprises administering to an animal infected with parasites an effective amount of a compound of claim 1.

4,530,922
FUNGICIDAL IMIDAZOLES AND TRIAZOLES CONTAINING SILICON

William K. Moberg, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 3, 1984, Ser. No. 567,889
Int. Cl.[3] A01N 55/00; C07F 7/10
U.S. Cl. 514—63 18 Claims

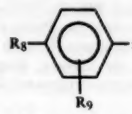
1. A compound of the formula:



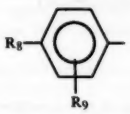
wherein

R_1 is H, $—CR_5{=}CHR_6$, $—CH_2CR_4{=}C(R_4)_2$, $—C{\equiv}CR_7$ or $OSi(CH_3)_3$;

R_2 is C_1–C_6 alkyl, vinyl or



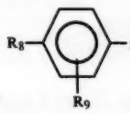
R_3 is C_1–C_6 alkyl,



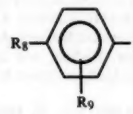
or OR_{10};

R_4 is independently H or CH_3;

R_5 and R_6 are independently H, C_1–C_2 alkyl or



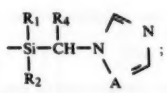
R_7 is H, C_1–C_4 alkyl or



R_8 is H, Cl, F, Br or phenyl;

R_9 is H, Cl, F or Br;

R_{10} is H, C_1–C_4 alkyl or



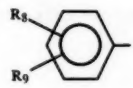
and

A is CH or N;

with the provisos that if R_3 is OR_{10}, then R_1 may not be H or $—OSi(CH_3)_3$;

if R_7 is C_1–C_4 alkyl or phenyl, then R_2 may not be C_1–C_6 alkyl or vinyl; and

when A is CH, then at least one of R_2 and R_3 is



and at least one of R_8 and R_9 is other than H;

and fungicidally active protic acid salts or metal complexes of said compound.

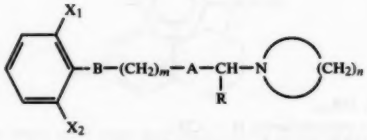
13. A method for controlling fungus diseases which comprises applying to a locus to be protected an effective amount of a compound of claim 1.

4,530,923
N-ACETAMILIDE, N-(PHENOXY-2-PROPANOL)- AND N-(PHENYLAMINO-2-PROPANOL)-CYCLICAMINES

József Rákóczi; Edit Berényi née Poldermann; Béla Fekete, all of Budapest; László Szekeres, Szeged; Gyula Papp, Szeged, and Éva Keszthelyi née Udvary, Szeged, all of Hungary, assignors to Egyt Gyogyszervegyeszeti Gyar, Budapest, Hungary

Filed Oct. 20, 1982, Ser. No. 435,493
Claims priority, application Hungary, Jun. 11, 1981, 3308/81
Int. Cl.[3] C07D *223/02, 295/08;* A61K *31/33, 31/55*
U.S. Cl. 514—183 8 Claims

1. A compound of the formula I



wherein
A is carbonyl or hydroxymethylene,
B is imino,
R is hydrogen or lower alkyl,
X_1 and X_2 are each lower alkyl,
n is 6 or 7, and
m is 0 or 1,
or a pharmaceutically acceptable acid addition, methyl iodide, or ethyl iodide salt thereof.

4,530,924
PHTHALOCYANINE COMPOUNDS AND ANTI-MICROBIAL USE

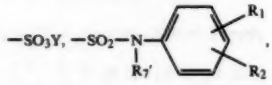
Rudolf Polony, Basel; Gerhard Reinert, Allschwil; Gerd Hölzle, Liestal; André Pugin, Riehen, and Rodolphe Vonderwahl, Reinach, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

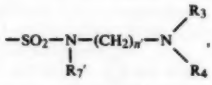
Division of Ser. No. 121,955, Feb. 15, 1980, Pat. No. 4,318,883, which is a continuation of Ser. No. 888,589, Mar. 20, 1978, abandoned. This application Oct. 30, 1981, Ser. No. 316,582
Claims priority, application Switzerland, Mar. 25, 1977, 3809/77
Int. Cl.[3] A01N *55/02, 43/38;* C07D *487/22;* C09B *47/02*
U.S. Cl. 514—191 9 Claims

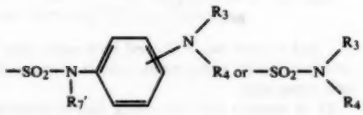
1. A phthalocyanine compound of the formula

$$Me'(PC—(R)_v$$

in which PC is the phthalocyanine ring system, v has any desired value between 1 and 4, Me' is Na, K, Ca, or AlX, in which X is an anion and R is a group of the formula







in which Y is hydrogen or an alkali metal, ammonium or amine ion, R_7' is a hydrogen or alkyl having 1 to 4 carbon atoms, n' is an integer from 2 to 6, R_1 and R_2 independently of one another are hydrogen, a sulpho group and salts thereof, a carboxyl group and salts thereof or a hydroxyl group and at least one of the radicals R_1 and R_2 is a sulpho or carboxyl group or a salt thereof, and R_3 and R_4 independently of one another are hydrogen, alkyl, hydroxyalkyl, cyanoalkyl, sulphoalkyol, carboxyalkyl or halogenalkyl, having, in each case, 1 to 6 carbon atoms, or unsubstituted phen or phenyl substituted by halogen, alkyl or alkoxy having 1 to 4 carbon atoms, sulpho or carboxyl or R_3 and R_4 together with the nitrogen atom to which they are bonded are a saturated 5-membered or 6-membered heterocyclic ring which additionally can also contain a nitrogen atom or oxygen atom as a ring member, and the radicals R are bonded to the phenyl nuclei of the phthalocyanine ring system and can be identical or different, when $v > 1$.

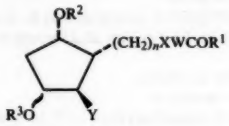
7. A composition comprising an antimicrobial amount of a phthalocyanine compound of claim 1 and a carrier.

4,530,925
AMINOCYCLOPENTANE ESTERS AND PHARMACEUTICAL FORMULATIONS

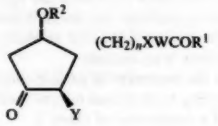
Eric W. Collington, Welwyn; Peter Hallett; Christopher J. Wallis, both of Royston, and John Bradshaw, Ware, all of England, assignors to Glaxo Group Limited, London, England

Filed Mar. 14, 1984, Ser. No. 589,303
Claims priority, application United Kingdom, Mar. 15, 1983, 8307099
Int. Cl.[3] A61K *31/535, 31/54;* C07D *295/14*
U.S. Cl. 514—211 10 Claims

1. Compounds of the general formulae (1a) and (1b)

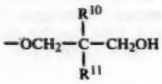


(1a)



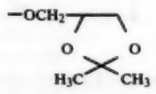
(1b)

wherein R^1 is
(a) $—OCH(CO_2R^4)_2$;
(b) $—A(CH_2)_mB(CH_2)_nR^6$ where A and B are —O—or —S—; m is 1-3, n is 0-3 and R^6 is phenyl;
(c) $—OR^9$ where R^9 is C_{3-6} alkynyl or thienylmethyl;
(d) $—OCH(CH_2OH)_2$;



(e)

where
R^{10} is —OH or $—CH_2OH$ and R^{11} is a hydrogen atom, C_{1-4} alkyl or $—CH_2OH$; or



(f)

n is 1 or 2;

W is straight or branched C_{1-7} alkylene;
X is cis or trans —CH=CH— or $—CH_2CH_2$;
Y is a saturated heterocyclic amino group (attached to the cyclopentane ring via the nitrogen atom) which has 5–8 ring members and (a) optionally contains in the ring —O—, —S—, $—SO_2$, or $—NR^{12}$ (where R^{12} is a hydrogen atom, C_{1-7} alkyl or aralkyl having a C_{1-4} alkyl portion); and/or (b) is optionally substituted by one or more C_{1-4} alkyl groups;
R^2 is (i) C_{1-5} alkyl substituted by (a) phenyl, (b) thienyl or (c) naphthyl (optionally substituted by C_{1-4} alkyl or C_{1-4}alkoxy) or (ii) cinnamyl;
R^3 is a hydrogen atom or C_{1-5} alkanoyl;
and the physiologically acceptable salts and solvates thereof.

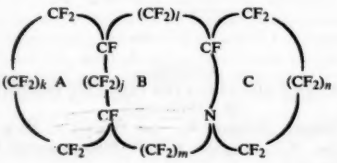
10. A pharmaceutical composition containing a compound as claimed in claim 1 and one or more pharmaceutical carriers.

4,530,926
PERFLUOROTRICYCLIC AMINES AS OXYGEN CARRIERS

Kazumasa Yokoyama, Toyonaka; Chikara Fukaya, Osaka; Yoshio Tsuda, Takarazuka; Taizo Ono, Osaka; Yoshio Arakawa, Suita; Yoshihisa Inoue, Kyoto; Youichiro Naito, Hirakata, and Tadakazu Suyama, Kyoto, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

Filed Jun. 17, 1983, Ser. No. 505,324
Claims priority, application Japan, Jun. 29, 1982, 57-112696; Jun. 29, 1982, 57-112697; Jun. 30, 1982, 57-114289; Jul. 2, 1982, 57-115966
Int. Cl.³ A61K *31/55, 31/445, 31/40;* **C07D** *455/06*
U.S. Cl. 514—214 **8 Claims**

1. A perfluoro compound represented by the formula,



(I)

wherein k, j, l and m are zero or an integer of from 1 to 3, and n is an integer of from 1 to 3, the rings A, B and C being optionally substituted with at least one trifluoromethyl group.

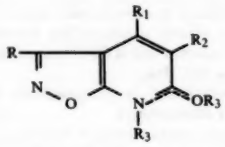
7. A composition for use as a blood substitute or infusion fluid which composition is an aqueous emulsion of a perfluoro compound as defined in claim 1.

4,530,927
ANTIINFLAMMATORY AND ANXIOLYTIC ISOXAZOLE-[5,4-B]PYRIDINES

Giorgio Winters, Milan, and Alberto Sala, Monza, both of Italy, assignors to Gruppo Lepetit S.p.A., Italy

Filed Mar. 28, 1983, Ser. No. 479,378
Claims priority, application United Kingdom, Mar. 30, 1982, 8209361
Int. Cl.³ A61K *31/55, 31/535;* **C07D** *498/04, 498/14*
U.S. Cl. 514—215 **3 Claims**

1. An isoxazole pyridine having the formula



wherein R represents a lower alkyl group of 1–4 carbon atoms or phenyl or halophenyl; R_1+R_2 represent an alkylene group $—(CH_2)_n—$ wherein n is an integer from 3 to 5 included and one of the methylene groups may be replaced by a group $=NR_6$ in which R_6 represents lower alkyl, lower alkanoyl or (lower alkoxy)carbonyl; R_3 is present only once and represents hydrogen, lower aikyl, hydroxy-lower alkyl, benzyl and, if it is bound to the heterocyclic nitrogen, also halo-lower alkyl or amine-lower alkyl in which the amino nitrogen may be dialkyl substituted or be included in a saturated heretocyclic ring, selected from the group consisting of N-methylpiperazino, N-phenylpiperazino and morpholino; the dashed line indicates that a double bond is present either between the heterocyclic nitrogen atom and the ring carbon atom, or between the oxygen and the ring carbon atom, in the first case the radical R_3 being bound to the oxygen, in the second case to the nitrogen atom.

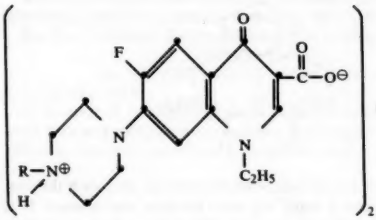
3. A method of reducing inflammation or anxiety in a patient in need thereof which comprises the daily administration of from 0.05 to 2.0 gm of a compound of claim 1.

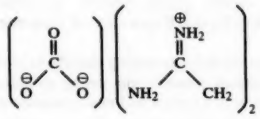
4,530,928
QUINOLINE CARBOXYLIC ACID COMPLEXES WITH GUANIDINIUM CARBONATE

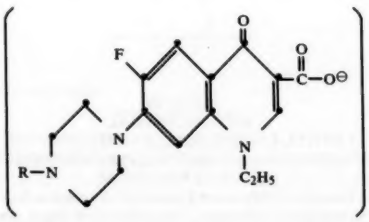
John L. Haslam, and Stefano A. Pogany, both of Lawrence, Kans., assignors to Merck & Co., Inc., Rahway, N.J.

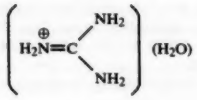
Continuation-in-part of Ser. No. 339,039, Jan. 13, 1982, abandoned. This application Dec. 22, 1982, Ser. No. 451,314
Int. Cl.³ A61K *31/495;* **C07D** *401/02*
U.S. Cl. 514—254 **9 Claims**

4. A method of treating a patient suffering from bacteria infection which comprises administering a therapeutically effective amount of a composition comprising a guanidino carbonate or guanidino complex of the formula:

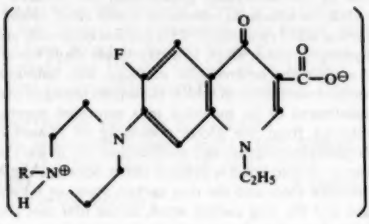








-continued



wherein R is hydrogen or C_{1-6} alkyl.

4,530,929

BENZOTRICYCLIC NITROGEN-CONTAINING DIONES AND THEIR USE IN REVERSING ELECTROCONVULSIVE SHOCK-INDUCED AMNESIA

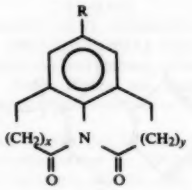
Donald E. Butler; Michael R. Pavia, and Fred M. Hershenson, all of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Feb. 2, 1984, Ser. No. 576,242

Int. Cl.³ C07D *455/00, 471/02*

U.S. Cl. 514—295 **16 Claims**

1. A compound having the structural formula I:



I

wherein x and y are independently zero or one, with the proviso that x and y many not both be zero, and wherein R is hydrogen, halogen; hydroxyl; —OR_1 where R_1 is alkyl from one to six carbon atoms, phenyl, or phenylmethyl; or —NR_2R_3 where R_2 and R_3 are alkyl of from one to six carbon atoms.

15. A composition for reversing the effects of electroconvulsive shock-induced amnesia comprising an amnesia reversing effective amount of a compound in accordance with claim **1** in combination with a pharmaceutically acceptable carrier.

4,530,930

ANTIMICROBIAL 1-ETHYL-6,8-DIFLUORO-1,4-DIHYDRO-7-(1-IMIDAZOLYL)-4-OXOQUINOLINE-3-CARBOXYLIC ACID DERIVATIVES

Toshio Uno, Daito; Masanori Takamatsu, Toyonaka; Koji Iuchi, Nara, and Goro Tsukamoto, Toyonaka, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

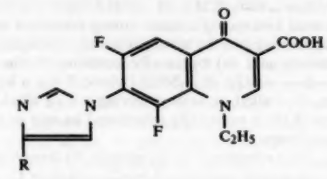
Filed Dec. 19, 1983, Ser. No. 562,735

Claims priority, application Japan, Dec. 29, 1982, 57-234595

Int. Cl.³ C07D *401/04;* **A61K** *31/415, 31/47*

U.S. Cl. 514—312 **6 Claims**

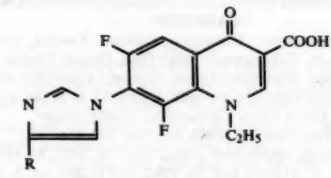
1. A 1-ethyl-6,8-difluoro-1,4-dihydro-7-(1-imidazolyl)-4-oxoquinoline-3-carboxylic acid compound of the formula:



(I)

wherein R is hydrogen atom or an alkyl group having 1 to 3 carbon atoms.

4. An anti-microbial composition, which comprises as an active ingredient a 1-ethyl-6,8-difluoro-1,4-dihydro-7-(1-imidazolyl)-4-oxoquinoline-3-carboxylic acid compound of the formula:



(I)

wherein R is hydrogen atom or an alkyl group having 1 to 3 carbon atoms, in admixture with a pharmaceutically acceptable carrier or diluent.

4,530,931

8-QUINOLINE CARBANILATES FOR THE INHIBITION OF LIPOLYSIS

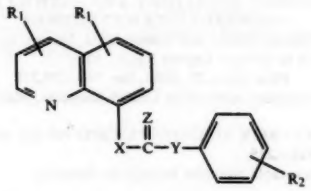
John H. Musser, Malvern, Pa., and Charles A. Sutherland, Hawthorne, N.Y., assignors to USV Pharmaceutical Corp., Tarrytown, N.Y.

Continuation of Ser. No. 455,377, Jan. 3, 1983, abandoned. This application Mar. 21, 1984, Ser. No. 591,702

Int. Cl.³ A61K *31/47;* **C07D** *215/16, 215/20, 215/38*

U.S. Cl. 514—312 **3 Claims**

1. A therapeutic composition for the inhibition of lipolysis in mammals which comprises, as an active ingredient, an effective amount to effect inhibition of lipolysis in said mammals of a member of the formula



and pharmaceutically acceptable salts thereof wherein:

R_1 is H, alkyl, alkoxy, trihalomethyl, chlorine;

X is in the 8 position and is $O(CH_2)_n$, or $N(CH_2)_n$;

Y is $O(CH_2)_n$, $N(CH_2)_n$;

R_2 is monosubstituted or independently disubstituted H, carboxyl or alkylcarboxy;

Z is 0; and

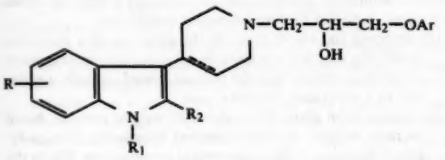
n is 0 to 10 inclusive, wherein the alkyl group and the alkyl moieties in alkoxy and alkylcarboxy having from 1 to 7 carbon atoms, in a pharmaceutically acceptable carrier.

4,530,932
4-(1H-INDOL-3-YL)-α-METHYL-PIPERIDINE-1-ETHANOL DERIVATIVES

Francois Clemence, and Neil L. Brown, both of Paris, France, assignors to Roussel Uclaf, Paris, France

Filed Sep. 28, 1983, Ser. No. 536,889
Claims priority, application France, Oct. 5, 1982, 82 16669
Int. Cl.[3] C07D *401/04;* A61K *31/44*
U.S. Cl. 514—318 24 Claims

1. A compound selected from the group consisting of 4-(1H-indol-3-yl)-α-methyl-piperidine-1-ethanol derivatives of the formula



I

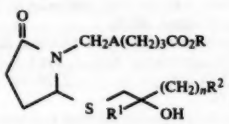
wherein R is selected from the group consisting of hydrogen, halogen, alkyl and alkoxy of 1 to 5 carbon atoms, $—NO_2$, $—NH_2$, $CF_3—$ and $CH_3S—$, R_1 is selected from the group consisting of hydrogen and alkyl of 1 to 5 carbon atoms, R_2 is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms and —OH, Ar is selected from the group consisting of phenyl, naphthyl, 1H-indol-4-yl, pyridyl, thienyl, thiazolyl and thiadiazolyl optionally substituted with a member of the group consisting of halogen, —OH, alkoxy of 1 to 4 carbon atoms hydroxyalkyl of 1 to 4 carbon atoms, alkoxyalkyl of 2 to 7 carbon atoms, carbamoyl, alkenyl and alkenyloxy of 2 to 5 carbon atoms, acylamino of an organic carboxylic acid of 1 to 7 carbon atoms, acyl of an alkanoic acid of 1 to 7 carbon atoms, $—NO_2$, $—NH_2$, alkyl of 1 to 4 carbon atoms, alkylsulfonamido of 1 to 4 alkyl carbon atoms, alkoxycarbonyl of 1 to 4 alkxoy carbon atoms, cycloalkyl of 3 to 7 carbon atoms, $—CF_3$ and alkynyl and alkynyloxy of 2 to 6 carbon atoms, the dotted line indicates the optional presence of a double bond and its non-toxic, pharmaceutically acceptable acid addition salt.

4,530,933
8-AZA-13-THIAPROSTANOIDS AND A METHOD OF USE THEREOF AS ANTI-ULCER AGENTS

Chia-Lin J. Wang, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 27, 1982, Ser. No. 452,882
Int. Cl.[3] C07D *207/26;* A61K *31/40*
U.S. Cl. 514—425 16 Claims

1. A compound of the formula:



wherein
A is CH=CH (cis or trans), C≡C, CH_2CH_2,

or $CHOHCH_2$;
R is H, C_1 to C_{12} n-alkyl, branched chain alkyl, or cycloalkyl, or a physiologically acceptable metal or amine salt cation;
R^1 is H, CH_3 or C_2H_5;
R^2 is CH_3 or CF_3; and
n is an integer from 4 to 9.

15. A pharmaceutical composition having cytoprotective activity comprising an effective amount of a compound according to claim 1 with a pharmaceutically acceptable carrier.

16. A method for preventing or treating ulcers in a human or an animal which comprises administering an effective amount of a pharmaceutical composition according to claim 15.

478-011 O.G.-85-10

4,530,934
PHARMACEUTICALLY ACTIVE URSOLIC ACID DERIVATIVE

Gaetano Clavenna, Rho; Carlo Farina, Valsolda; Mario Pinza, Corsico, and Giorgio Pifféri, Milan, all of Italy, assignors to I.S.F. Spa, Milan, Italy

Filed Jul. 25, 1983, Ser. No. 511,761
Claims priority, application Italy, Jul. 26, 1982, 22566 A/82
Int. Cl.[3] A61K *31/225;* C07C *69/40, 67/08*
U.S. Cl. 514—548 5 Claims

1. 3β-(3-Carboxypropionyloxy)ursa-9(11),12-dien-28-oic acid and the pharmaceutically acceptable, non-toxic salts thereof.

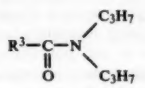
4. A therapeutic composition for the treatment of ulcers comprising an antiulcerogenically effective amount of a compound according to claim 1 in admixture with a pharmaceutically acceptable excipient.

4,530,935
INSECT REPELLENTS

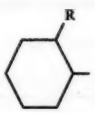
Terrence P. McGovern, Bowie, Md., and Carl E. Schreck, Gainesville, Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation of Ser. No. 349,948, Feb. 18, 1982, abandoned, which is a continuation of Ser. No. 240,446, Mar. 4, 1981, abandoned, which is a division of Ser. No. 8,814, Feb. 2, 1979, Pat. No. 4,291,041. This application May 3, 1983, Ser. No. 488,530
Int. Cl.[3] C07C *103/737;* A01N *37/18*
U.S. Cl. 514—613 2 Claims

1. A method of repelling stable flies, blackflies, deerflies, sand flies and mosquitoes comprising applying to the skin an effective repellent amount of a compound of the formula



wherein R^3 is



and R is hydrogen.

4,530,936
COMPOSITION AND METHOD FOR INHIBITING THE ABSORPTION OF NUTRITIONAL ELEMENTS FROM THE UPPER INTESTINAL TRACT

Sarfaraz Niazi, Burr Ridge, Ill., assignor to Farmacon Research Corporation, Westchester, Ill.

Filed Jul. 8, 1983, Ser. No. 512,193
Int. Cl.[3] A61K *31/025*
U.S. Cl. 514—749 3 Claims

1. The method of inhibiting or preventing the absorption of at least one nutritional elements selected from the group consisting of carbohydrates, fats, proteins, vitamins, and minerals

from the gastrointestinal tract which comprises ingesting perflorodecalin in an amount sufficient to form a nutritional element-impermeable film thereof on at least a substantial part of the inner wall of the upper intestine and maintaining said film for a time long enough to inhibit absorption of nutritional elements from the gastrointestinal tract.

4,530,937

METHOD FOR THE MANUFACTURE OF POLYISOCYANURATE FOAMS

Kenneth B. White, Lisle, Ill., assignor to Akzona Incorporated, Enka, N.C.

Filed Mar. 21, 1984, Ser. No. 592,329

The portion of the term of this patent subsequent to Jan. 10, 2001, has been disclaimed.

Int. Cl.³ C08G *18/14*

U.S. Cl. 521—105 **14 Claims**

1. A method for the manufacture of polyisocyanurate foams, comprising blending a "B" side with an "A" side, said "A" side comprising an isocyanate and said "B" side comprising a diol, an amine/quaternary ammonium borate ester blend, a surfactant, a blowing agent, and a catalyst, said foams having a friability not exceeding 30% and the said catalyst not to exceed 20% of the total weight of said "B" side.

4,530,938

POLYOLS FOR URETHANE-MODIFIED ISOCYANURATE FOAMS

Kenneth B. White, Lisle, Ill., assignor to Akzona Incorporated, Enka, N.C.

Filed Mar. 21, 1984, Ser. No. 592,303

The portion of the term of this patent subsequent to Jan. 10, 2001, has been disclaimed.

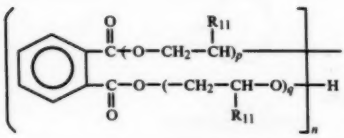
Int. Cl.³ C08G *18/14*

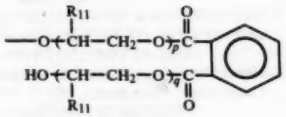
U.S. Cl. 521—105 **14 Claims**

1. A method for the manufacture of urethane-modified polyisocyanurate foams, comprising blending an isocyanate with a "B" side, said "B" side comprising a polyol blend, a surfactant, a blowing agent, said polyol blend comprising:

(a) at least 5% (wt.) of a mixture of a polyalkoxylated amine and a polyalkoxylated quaternary ammonium borate ester, the weight ratio of said polyalkoxylated amine to said polyalkoxylated quaternary ammonium borate ester being between 1:0.005 and 1:12;

(b) at least 40% (wt.) of a resin polyol, said resin polyol comprising at least 70% (wt.) of a combination of polymers and monomers having the general formula:





wherein n is between 0 and 50, R_{11} is either H— or CH_3—, and p and q are each integers between 1 and 10; and

(c) the remainder of said polyol blend being a polyether or polyester polyol.

4,530,939

LOW K-FACTOR CLOSED CELL PHENOL-ALDEHYDE FOAM AND PROCESS FOR PREPARATION THEREOF

Gregory K. Rickle, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 347,830, Feb. 11, 1982, abandoned. This application Dec. 6, 1983, Ser. No. 558,663

Int. Cl.³ C08J *9/14*

U.S. Cl. 521—110 **11 Claims**

1. An improved process for preparing a generally closed cell, low K-factor foam material, the foam material resulting from a process wherein a phenol-aldehyde resole resin, a blowing agent and a surfactant are admixed with an acid catalyst to form an admixture which is then poured into a forming means and cured, wherein the improvement comprises:

(a) stripping the resole resin, in the presence of a viscosity-modifying amount of a suitable solvent, to a water content of less than about 7 weight percent, based on resin weight, and to a workable viscosity; and

(b) adding from about 10 to about 20 weight percent, based on resin weight, of an unbranched dihydroxy ether polyglycol having a molecular weight greater than 300 to the stripped resole resin.

4,530,940

STABILIZED MELAMINE RESIN FOAMS

Frank P. Woerner, Wachenheim; Horst Reimann, Worms; Harald Mahnke, Ludwigshafen; Peter Neumann, Wiesloch; Gerhard Turznik, Ludwigshafen, and Hanshelmut Käeppel, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 28, 1984, Ser. No. 625,690

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1983, 3323943

Int. Cl.³ C08J *9/30*

U.S. Cl. 521—124 **4 Claims**

1. A stabilized melamine/formaldehyde resin foam which contains, as a stabilizer, a copper or iron compound selected from the group consisting of a copper oxide, hydroxide or carbonate, $Cu_3(PO_4)_2$, $CuSO_4$, CuBr, $CuBr_2$, CuCl, $CuCl_2$, $Cu(NO_3)_2$, CuI, CuI.KI, $Cu(SCN)_2$, a copper salt of a monobasic or polybasic carboxylic acid, aromatic sulfonic acid or organic phosphoric acid, a neutral or ionic complex of divalent copper, $FeSO_4$, $FeCl_2$, $FeCl_3$, $(NH_4)Fe(SO_4)_2$, $Fe(NO_3)_2$, iron formate, basic iron(III) acetate and iron(II) oxalate in an amount corresponding to from 10 ppm to 3%, based on the weight of the melamine/formaldehyde resin, of Cu or Fe.

4,530,941

REACTION INJECTION MOLDED POLYURETHANES EMPLOYING HIGH MOLECULAR WEIGHT POLYOLS

Robert B. Turner; Richard D. Peffley, and James A. Vanderhider, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 461,046, Jan. 26, 1983, abandoned. This application Nov. 2, 1983, Ser. No. 548,179

Int. Cl.³ C08G *18/14, 18/32, 18/48, 18/65*

U.S. Cl. 521—176 **24 Claims**

1. In a process for preparing molded polymer systems which systems employ a composition which comprises

(A) at least one relatively high molecular weight hydroxyl-containing polyol;

(B) at least one chain extender; and

(C) at least one polyisocyanate, polyisothiocyanate or mixture thereof;

the improvement which comprises replacing at least a portion of component (A) with

(D) a material or mixture of materials having an average equivalent weight of at least 500 and which contains a plurality of oxyalkylene groups and at least one primary or secondary amine group per molecule with the proviso that when such material contains only one primary or secondary amine

group per molecule, it also contains at least one other group containing a hydrogen atom reactive with NCO and/or NCS group per molecule; and wherein

(i) of the total number of hydrogen equivalents contributed by hydroxyl groups and amine groups in components (A) and (D), from about 25 to about 100 percent of such hydrogen equivalents are derived from amine groups; and

(ii) the NCX index is from about 0.6 to about 1.5 with the proviso that when the system contains an NCX trimerization catalyst, the NCX index can be as high as about 5.

6. A composition comprising

(A) an active hydrogen-containing composition comprising

(1) at least one material containing at least one primary or secondary amine group per molecule and has an average equivalent weight of at least about 500; and

(2) optionally a polyol or mixture of polyols whose source of active hydrogen atoms is derived only from groups other than primary or secondary amine groups, has an average active hydrogen equivalent weight of at least 500; with the proviso that if polyol (A-1) has only one primary or secondary amine group per molecule, then it also has at least one other group reactive with an NCO and/or NCS group per molecule and wherein in component (A) from about 25 to about 100 percent of the active hydrogen equivalents contained therein are derived from amine groups; and

(B) as a chain extender composition, one or more members selected from

(1) an aliphatic amine-containing material having at least one primary amine group or a mixture of such materials, which material or mixture of materials has an average aliphatic amine hydrogen functionality of from about 2 to about 16, and an average aliphatic amine hydrogen equivalent weight of from about 15 to about 500;

(2) a hydroxyl-containing material free of aliphatic amine hydrogen atoms or mixture of such materials, which material or material mixture has an average OH functionality of from about 2 to about 4, and an average OH equivalent weight of from about 30 to about 120;

(3) an aromatic amine-containing compound which is essentially free of aliphatic amine hydrogens and which contains at least 2 aromatic amine hydrogen atoms or a mixture of such materials;

(4) mixtures thereof; and wherein

(i) when component (B) has an average equivalent weight of less than about 50, component (B) is present in quantities of from about 5 to about 60, percent by weight of component (A);

(ii) when component (B) has an average equivalent weight of from about 50 to about 150, component (B) is present in quantities of from about 5 to about 90, percent by weight of component (A);

(iii) when component (B) has an average equivalent weight of greater than about 150, component (B) is present in quantities of from about 5 to about 120, percent by weight of component (A); and

(iv) equivalent weight is the average molecular weight divided by the total number of hydrogen atoms attached to an oxygen atom or a nitrogen atom.

4,530,942

CMC/PEG CONTAINING HYDROPHILIC DENTURE ADHESIVE

Dadi J. Dhabhar, Norwalk, and Nicholas F. Schmidt, Brookfield, both of Conn., assignors to Richardson-Vicks Inc., Wilton, Conn.

Continuation of Ser. No. 403,090, Jul. 29, 1982, abandoned. This application Apr. 12, 1984, Ser. No. 599,622

Int. Cl.³ A61K *6/08*

U.S. Cl. 523—118 **9 Claims**

1. A denture adhesive composition consisting essentially of a substantially anhydrous mixture of from about 25 to about 50 percent w/w sodium carboxymethycellulose as the sole adhesive component and from about 50 to about 75 percent w/w of a polyethylene glycol fraction comprising one or more polyethylene glycols each having an average molecular weight of from 200 to 20,000 and said fraction having a viscosity of from about 44 to about 25,600 centipoises at about 60° C.

4,530,943

PROCESS FOR THE RAPID DISSOLUTION OF WATER-SOLUBLE POLYMERS

Wolfgang Hübner, Kempen; Helmut Klein, Krefeld; Erhard Goldacker, Meerbusch, and Otto Schroers, Krefeld, all of Fed. Rep. of Germany, assignors to Chemische Fabrik Stockhausen GmbH, Krefeld, Fed. Rep. of Germany

Filed Jul. 29, 1983, Ser. No. 518,510

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1982, 3228812

Int. Cl.³ C08J *3/04, 3/06, 3/08*

U.S. Cl. 523—318 **6 Claims**

1. In the dissolution of a water soluble polymer by mixing the polymer with water and a hydrophilic wetting agent, the improvement which comprises adding water as jets or with stirring to effect mixing, to a water-in-oil emulsion of the polymer or to a dispersion of the solid polymer in oil, the dispersion or emulsion being free of the hydrophilic wetting agent, and thereafter adding the wetting agent to the dispersion or emulsion, thereby effecting phase inversion and rapid dissolution of the polymer.

3. A process according to claim 1, wherein the water is added by means of a nozzle.

4. A process according to claim 1, wherein the water is added tangentially to the surface of the dispersion or emulsion.

6. A process according to claim 3, wherein the water is added tangentially to the surface of the dispersion or emulsion at a pressure of 15 to 80 bar absolute and the wetting agent is added under pressure.

4,530,944

MONOMER-PLASTICIZED ELASTOMERS AND PROCESS FOR PRODUCING SAME

Parviz Hamed, Framingham, Mass., assignor to SW Industries, Inc., Providence, R.I.

Division of Ser. No. 422,278, Sep. 23, 1982, Pat. No. 4,485,198. This application Jul. 2, 1984, Ser. No. 626,711

Int. Cl.³ C08J *3/02;* **C08F** *265/08*

U.S. Cl. 523—335 **7 Claims**

1. A method for forming a vulcanized rubber product comprising:

providing 100 parts by weight, solids basis, of a latex of an elastomeric polymer;

admixing 0.5–200 parts by weight of a polymerizable monomer with said latex;

coagulating the solids in said latex, said solids including said monomer and said elastomeric polymer, said admixing and coagulating being effected in the absence of a polymerization initiator for the monomer with substantially no polymerization of said monomer and substantially no crosslinking of or grafting onto said elastomeric polymer;

separating said coagulated solids from the aqueous phase as a homogeneous non-crosslinked elastomeric composition;

compounding said non-crosslinked elastomeric composition with a vulcanizing agent for said elastomeric polymer and a polymerization initiator for said monomer;

shaping said compounded composition into the desired product; and

inducing polymerization and vulcanization to cure the shaped product.

4,530,945

PIGMENT GRINDING VEHICLE

Roger M. Christenson; Roger L. Scriven, both of Gibsonia; Robert D. Jerabek, Glenshaw; Jeffrey G. Koren, Butler, and Mark W. Johnson, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 430,184, Sep. 30, 1982, abandoned. This application Aug. 15, 1984, Ser. No. 641,351

Int. Cl.[3] C08L 63/00

U.S. Cl. 523—400 13 Claims

1. A quaternary ammonium group-containing material which is obtained by reacting:

(i) a 1,2-epoxy-containing material which is a polyepoxide or a monoglycidyl ether or ester, with

(ii) an amine containing an organic group which contains an acyclic moiety of at least 8 carbon atoms, and also containing a group of the structure:

where R_1 is hydrogen or lower alkyl containing 1 to 4 carbon atoms,

under conditions sufficient to form the quaternary ammonium group.

9. A pigment paste comprising:

(a) a quaternary ammonium group-containing material, characterized in that at least one organic group of the quaternary ammonium group contains an acyclic moiety of at least 8 carbon atoms and also contains a group of the structure:

where R_1 is hydrogen or lower alkyl containing 1 to 4 carbon atoms, and

(b) a pigment dispersed therein.

4,530,946

RESINOUS EMULSION COMPRISING MICROPARTICLES FOR COATING USE AND PREPARATION THEREOF

Kazunori Kanda, Yao; Keizou Ishii, Ashiya; Katsuaki Kida, Osaka; Shinichi Ishikura, Kyoto, and Ryuzo Mizuguchi, Yahata, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 460,878, Jan. 25, 1983, Pat. No. 4,461,870. This application Mar. 2, 1984, Ser. No. 585,595

Claims priority, application Japan, Jan. 27, 1982, 57-13053; Jan. 27, 1982, 57-13054

Int. Cl.[3] C08L 63/10

U.S. Cl. 523—418 3 Claims

1. In a resinous emulsion comprising a dispersion medium of water and a dispersed phase of polymer microparticles having an average diameter of 0.02 to 0.5μ which are insoluble in water and are maintained in a stabilized state of dispersion therein, the improvement wherein the microparticles are composed of a crosslinked copolymer comprising α,β-ethylenically unsaturated monomers and a crosslinking monomer which is at least difunctional, said copolymer having physically adhered or covalently bonded thereto a resinous portion having an amphoionic group of the formula:

wherein R is a member selected from substituted or unsubstituted alkylene having 1 to 6 carbon atoms and phenylene and Y is —COOH or —SO_3H, said resinous portion being selected from the group consisting of modified epoxy, acrylic, polyester and melamine resins.

4,530,947

ANTICORROSIVE COATING COMPOSITION

Hidehiko Kojo, Koshigaya, and Koji Akimoto, Tokyo, both of Japan, assignors to Asahi Denka Kogyo K.K., Tokyo, Japan

Filed Apr. 24, 1984, Ser. No. 603,396

Int. Cl.[3] C08L 63/00, 95/00

U.S. Cl. 523—450 8 Claims

1. A coating composition which comprises a mixture of

(A) a polyol resin obtained by the reaction of an amino compound having at least one primary or secondary amino group with a prepolymer containing epoxy groups which prepolymer has been prepared by reacting an epoxy resin, with

a polyhydroxy phenolic compound selected from the group consisting of polynuclear polyhydroxy phenols having adjacent hydroxy groups, polyol esters of polyhydroxy phenolic carboxylic acids having adjacent hydroxy groups, and mixtures thereof,

said prepolymer containing at least 0.05 mole of said polyhydroxy phenolic compound, per molecule,

and having an average epoxide equivalent of less than 3000;

(B) a compound having more than one isocyanate group or groups which change to isocyanate groups under conditions effective for hardening the coating composition; and

(C) a material selected from the group consisting of coal tar, coal tar pitch, cut-back tar, bojuntan and asphalt,

wherein the reaction ratio of said amino compound to said prepolymer, by equivalents of groups of said amino compound that are reactive with the epoxy groups of said prepolymer, is from 1.1 to 0.7; the ratio of (A) to (B), by equivalents of the hydroxy groups of (A) to the isocyanate groups of (B), is from 0.4 to 1.2; and the weight ratio of (C) to (A) is from 0.5 to 2.

4,530,948

ROOM TEMPERATURE COATING COMPOSITIONS CONTAINING HYDROLYZED EPOXY NOVOLAC RESINS

Michael B. Cavitt, and Charles H. Moore, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 408,352, Aug. 16, 1982, abandoned. This application Jun. 14, 1984, Ser. No. 620,592

Int. Cl.[3] C08K 5/01, 5/07, 5/06; C08L 63/04

U.S. Cl. 523—454 5 Claims

1. A coating composition which is curable at temperatures less than about 35° C. which comprises

(1) the product resulting from hydrolyzing at least one unhydrolyzed epoxy novolac resin having an average epoxide functionality before hydrolysis of from about 2.01 to about 10 and wherein from about 3 to about 50, percent of the epoxy groups have been hydrolyzed;

(2) a curing amount of at least one curing agent for component (1) selected from polyamides, primary amine compounds, secondary amine compounds or mixtures thereof; and

(3) a sufficient quantity of a suitable solvent system so as to provide the coating composition with a suitable application viscosity.

4,530,949

HOUSING FOR ELECTRICAL OR ELECTRONIC EQUIPMENT

Alan W. Atkinson, Rochdale; David R. Hurst, Oldham, and Kenneth T. Somerfield, Stourbridge, all of England, assignors to T&N Materials Research Limited, Manchester, England

Filed Jul. 19, 1984, Ser. No. 632,523

Claims priority, application United Kingdom, Jul. 30, 1983, 8320607

Int. Cl.³ C08K 3/04

U.S. Cl. 523—512 9 Claims

1. A housing for electrical or electronic equipment made by moulding under heat a composition comprising an organic thermosetting resin which contains an amount of heat-exfoliated porous graphite of density below 100 kg/m³, said amount being sufficient to impart to the moulded article an electrical resistivity not greater than 10 ohm-cm and forming 0.5 to 20% by weight of the composition.

4,530,950

PIPERIDINE DERIVATIVES AND USE THEREOF AS STABILIZERS FOR POLYMERS

Guiseppe Raspanti; Norberto Fossati, and Attilio Ferrari, all of Milan, Italy, assignors to APITAL Produzioni Industriali S.p.A., Milan, Italy

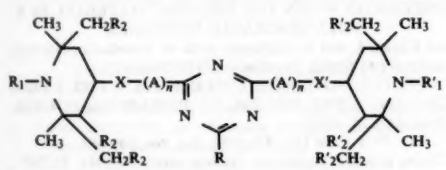
Filed Jan. 24, 1983, Ser. No. 460,162

Claims priority, application Italy, Feb. 10, 1982, 19554 A/82

Int. Cl.³ C08K 5/34

U.S. Cl. 524—100 11 Claims

1. Compounds having the general formula I



I

in which R denotes hydrogen, a straight-chain or branched-chain alkyl radical having 1 to 18 carbon atoms, a cycloalkyl radical having 5 to 12 carbon atoms, an alkenyl radical having 3 to 18 carbon atoms, an aralkyl radical having 7 to 19 carbon atoms or an aryl radical having 6 to 12 carbon atoms;

R_1 and R'_1 can be the same or different and denote hydrogen, a straight-chain or branched alkyl radical having 1 to 12 carbon atoms, an alkenyl radical having 3 to 8 carbon atoms, or an aralkyl radical having 7 to 19 carbon atoms;

R_2 and R'_2 can be the same or different and denote hydrogen or methyl;

X and X′ can be the same or different and denote oxygen or the group N-R_3 in which R_3 denotes hydrogen, a straight-chain or branched alkyl or hydroxyalkyl radical having 1 to 12 carbon atoms, a cycloalkyl radical having 5 to 12 carbon atoms, or an aralkyl radical having 7 to 12 carbon atoms,

A and A′ can be the same or different and denote the radical $(CH_2)m$-X″ in which X″ has the meaning previously defined for X and X′, and is a direct bond to the triazine ring, m can be 2 or 3 and n is equal to zero or 1, and salts thereof with organic or inorganic acids.

4,530,951

FLAME RETARDANT POLYAMIDE COMPOSITIONS

Ian G. Williams, Cleveland, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Feb. 29, 1984, Ser. No. 584,910

Claims priority, application United Kingdom, Mar. 17, 1983, 8307409

Int. Cl.³ C08K 5/03, 3/22

U.S. Cl. 524—101 5 Claims

1. A glass-reinforced, fire retardant, arc-track resistant composition characterised in that it contains:

(a) at least 35% by weight of a fibre-forming polyamide,

(b) 15 to 25% by weight of glass fibres,

(c) 16–30% by weight of melamine cyanurate,

(d) 2 to 7%, by weight of the condensation product of 2 moles of chlorocyclopentadiene and 1 mole of cyclooctadiene, and an amount of

(e) antimony oxide, being the sole fire retardant synergist present,

to give a weight ratio of (d) to (e) between 1:1 and 5:1 and wherein the constituents of the composition total 100%.

4,530,952

POLYPHENYLENE ETHER COMPOSITION IMPROVED IN PROCESSABILITY

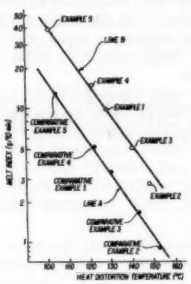
Toshiyuki Tayama, and Ryohei Tanaka, both of Ibaraki, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1983, Ser. No. 564,190

Claims priority, application Japan, Dec. 29, 1982, 57-233289

Int. Cl.³ C08K 5/20; C08L 71/04

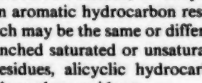
U.S. Cl. 524—159 9 Claims



1. A polyphenylene ether composition having improved processability comprising:

(a) a polyphenylene ether; and

(b) 0.1–25 weight % of the composition, of a diamide compound of the formula



wherein

R^1 is a C_{1-10} linear or branched saturated or unsaturated aliphatic hydrocarbon residue, an alicyclic hydrocarbon residue, or an aromatic hydrocarbon residue; and

R^2 and R^3, which may be the same or different, each is C_{1-10} linear or branched saturated or unsaturated aliphatic hydrocarbon residues, alicyclic hydrocarbon residues, or aromatic hydrocarbon residues;

wherein R^1, R^2 and R^3 may have one or more substituents selected from the group consisting of:

—R^4, wherein R^4 is C_{1-8} hydrocarbon;

—X, wherein X is a halogen selected from the group consisting of Cl, Br, and F;

—OR^5, wherein R^5 is H or C_{1-8} hydrocarbon;
—NR^6R^7, wherein R^6 and R^7 are H or C_{1-8} hydrocarbon;
—$OCOR^8$, wherein R^8 is H or C_{1-8} hydrocarbon;
—COOH, a metal salt thereof or acid anhydride thereof;
—SO_3H;
—NO_2;
—NO; and
—CN.

4. The polyphenylene ether composition as claimed in claim 1, wherein

R^2 and R^3 in the diamide compound are phenyl, which may have one or more substitutents selected from the group consisting of
—R^4, wherein R^4 is C_{1-8} hydrocarbon;
—X, wherein X is a halogen selected from the group consisting of Cl, Br, and F;
—OR^5, wherein R^5 is H or C_{1-8} hydrocarbon;
—NR^6R^7, wherein R^6 and R^7 are H or C_{1-8} hydrocarbon;
—$OCOR^8$, wherein R^8 is H or C_{1-8} hydrocarbon;
—COOH, a metal salt thereof or acid anhydride thereof;
—SO_3H;
—NO_2;
—NO;
—CN; and

the diamide compound has a melting point of 130° C. or more.

4,530,953

POLYESTER RESIN COMPOSITION HAVING AN IMPROVED MOLD RELEASE PROPERTY

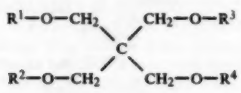
Tomohiko Yoshida, Kamakura, Japan, assignor to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Filed Apr. 12, 1984, Ser. No. 599,578
Claims priority, application Japan, Apr. 15, 1983, 58-65724
Int. Cl.³ C08K *5/10, 7/12, 7/14;* C08L *67/02*
U.S. Cl. 524—311 8 Claims

1. A polyester resin composition comprising

5% to 60% by weight of inorganic fibers;

0.01% to 2% by weight of at least one ester compound of the formula (I):



(I)

wherein R^1, R^2, R^3, and R^4 respectively represent, independently from each other, a member selected from the group consisting of a hydrogen atom and alkyl carbonyl radicals of the formula $C_nH_{2n+1}CO$— wherein n represents an integer of from 10 to 30, at least one member of R^1, R^2, R^3, and R^4 representing said alkyl carbonyl radical; and

a balance of a polyethylene terephthalate resin.

4,530,954

WATER-BASED LIME DISPERSION PAINT

René Arpin, Lyons, France, assignor to Rhone-Poulenc Specialties Chimiques, Courbevoie, France

Filed Jan. 18, 1984, Ser. No. 571,710
Claims priority, application France, Jan. 28, 1983, 83 01304
Int. Cl.³ C08K *5/05*
U.S. Cl. 524—387 13 Claims

1. A water-based lime dispersion paint comprising:

(a) a binder comprising a film-forming copolymer of an alkyl acrylate monomer having an alkyl group containing from 1 to 8 carbon atoms, and a nonionic ethylenic monomer, the copolymer being dispersed in an aqueous medium, the dispersion being stable at a basic pH, and the copolymer having a glass transition temperature in the range of −5° C. to 25° C.;

(b) a pulverulent material comprising one or more pigments and airy slaked lime having a hydraulicity index of less than 0.015; and

(c) adjuvants being stable at a basic pH and including at least D-sorbitol,

wherein the binder, the pulverulent material, and the adjuvants are present in an amount effective to form a water-based lime dispersion paint.

4,530,955

WATER TREATMENT COMPOSITION COMPRISING A HYDROLYZED MALEIC ANHYDRIDE COPOLYMER AND A ZINC COMPOUND

David Wilson, Tyldesley, and John A. Reverter, Pendleton, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 28, 1984, Ser. No. 594,149
Claims priority, application United Kingdom, Apr. 8, 1983, 8309573
Int. Cl.³ C02F *5/08;* C23F *11/08*
U.S. Cl. 524—434 7 Claims

1. A composition for treating water or an aqueous system which comprises 2.5 to 80% by weight of zinc (calculated as Zn++) and from 97.5 to 20% by weight of a hydrolysed copolymer of maleic anhydride with a monoethylenically unsaturated monomer or a mixture of monomers, the molar ratio of maleic anhydride to the total of other monomers being from 1:1 to 100:1, the number average molecular weight of the copolymer being up to 1000.

4,530,956

PROCESS FOR THE PREPARATION OF AQUEOUS DISPERSIONS OF ORGANIC MATERIAL AND POSSIBLE FURTHER CONVERSION TO A POLYMER DISPERSION WHEN THE ORGANIC MATERIAL IS A POLYMERIZABLE MONOMER

John Ugelstad, and Arvid Berge, both of Trondheim, Norway, assignors to Sintef, Trondheim NTH, Norway

PCT No. PCT/NO82/00052, § 371 Date Jun. 7, 1983, § 102(e) Date Jun. 7, 1983, PCT Pub. No. WO83/01453, PCT Pub. Date Apr. 28, 1983
PCT Filed Oct. 19, 1982, Ser. No. 509,464
Claims priority, application Norway, Oct. 21, 1981, 813547
Int. Cl.³ C08F *2/16*
U.S. Cl. 524—458 10 Claims

1. Process for the preparation of aqueous dispersions of somewhat water-soluble, low molecular weight organic material, in which swellable particles prepared in a first step are swelled with the organic material in a second step, and, if desired, the prepared dispersion is converted to a polymer dispersion when the organic material is a polymerizable monomer, and wherein in the first step, oligomer or oligomer-polymer particles are prepared by

(a) dispersing an aqueous mixture which contains an oil-soluble initiator or a solution of an oil-soluble initiator in an organic solvent, and then swelling the dispersed initiator-containing drops with monomer and effecting polymerization, or

(b) swelling polymer particles in an aqueous dispersion with vinyl monomer and an oil-soluble initiator and effecting polymerization, the ratio between initiator and monomer used being so high that in the polymerization an oligomer having a degree of polymerization of 5–200 is formed, and in the second step, if desired after dilution with water and addition of emulsifier, the organic material is added which has a solubility in water >10, preferably >100 times higher than that of the oligomer, and which diffuses through the aqueous phase and swells the oligomer or oligomer-polymer

particles in a ratio by volume of >20:1, and when the organic material is a polymerizable monomer, initiator is also added in the second step, and polymerization is effected.

4,530,957
NON-AQUEOUS DISPERSIONS BASED ON CAPPED STABILIZERS AND REACTANTS COMPRISING POLYFUNCTIONAL MONOMERS I

Ares N. Theodore, Farmington Hills, and Mohinder S. Chattha, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 5, 1983, Ser. No. 455,701

The portion of the term of this patent subsequent to Oct. 30, 2001, has been disclaimed.

Int. Cl.[3] **C08J** *3/08;* **C08L** *51/00, 51/06, 51/08*

U.S. Cl. 524—504 **14 Claims**

1. A stable dispersion containing crosslinked polymer particles formed by reactions comprising addition polymerization of:

(a) between about 0.5 and about 20 weight percent each of first and second monomers, wherein said first monomer bears ethylenic unsaturation and functionality capable of crosslinking reaction with other functionality present on said second monomer, said second monomer bearing at least two functional groups of said other functionality and bearing no ethylenic unsaturation; and

(b) between about 99 and about 60 weight percent of at least one other monoethylenically unsaturated monomer;

in the presence of (I) an organic liquid which is a solvent for the polymerizable monomers, but a non-solvent for the resultant polymer, and (II) polymeric dispersion stabilizer containing at least two segments with one segment being solvated by said organic liquid and the second segment being of different polarity than said first segment and relatively insoluble in said organic liquid, wherein the reaction is carried out at elevated temperatures such that the dispersion polymer first forms and then is crosslinked, wherein the precursor of said first segment of said stabilizer comprises a long chain hydrocarbon molecule having only one reactive group per said molecule.

14. Crosslinked polymer particles obtained by the removal of said solvent from said dispersion formed in claim 1.

4,530,958
THERMOSETTING METALLIC COATING COMPOSITIONS

Akira Kasari, Hiratsuka; Kazuhiko Ohira, Nagoya, and Hiroshi Inoue, Hiratsuka, all of Japan, assignors to Kanzai Paint Company, Limited, Amagasaki, Japan

Filed Dec. 5, 1983, Ser. No. 557,833

Claims priority, application Japan, Dec. 7, 1982, 57-214495

Int. Cl.[3] **C08K** *3/08;* **C08L** *33/14, 33/02, 61/20*

U.S. Cl. 524—512 **7 Claims**

1. A thermosetting metallic coating composition in the form of an organic solution comprising a resin composition consisting of an acrylic resin and an amino resin, the amino resin being present in an amount of from 5 to 70 parts by weight per 100 parts by weight of the acrylic resin, a metallic flake pigment, at least one organic solvent and water, the acrylic resin having carboxyl groups on the resin skeleton wholly or partially neutralized, said acrylic resin, prior to neutralization, having an acid value of 5 to 100 and a hydroxyl value of 20 to 200 and the water being present in the coating composition in an amount of about 10 to about 100 parts by weight per 100 parts weight of the resin composition and of about 2 to about 40% by weight of the total amount of the water and the organic solvent, the amount of solvent being correspondingly from 98 to 60% by weight based on the total amount of the water and solvent, and the non-volatile solids content of the composition being from 15 to 50% by weight.

7. A thermosetting metallic coating composition as defined in claim 1 in which the organic solvent is at least one of a slowly volatile hydrophilic organic solvent having a vapor pressure of less than 7.5 mmHg at a temperature of 20° C. and a rapidly volatile hydrophilic and/or hydrophobic organic solvent having a vapor pressure of more than 7.5 mmHg at a temperature of 20° C., the hydrophilic solvent being soluble in water at ambient temperature in an amount of over 50 parts by weight per 100 parts by weight of water, and the hydrophobic solvent having a lower solubility to water than the hydrophilic solvent, the slowly volatile solvent being present in an amount of from 5 to 70% by weight and the rapidly volatile solvent being present in an amount of from 95 to 30% by weight, both based on the total amount of the two solvents.

4,530,959
PNEUMATIC TIRE WITH TREAD OF MEDIUM VINYL POLYBUTADIENE/RUBBER BLEND

Robert G. Armbruster, Wadsworth, Ohio, and Richard M. Scriver, Luxembourg, Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 8, 1984, Ser. No. 587,731

Int. Cl.[3] **B60C** *1/00;* **C08L** *9/00, 7/00, 9/06*

U.S. Cl. 524—526 **12 Claims**

1. A pneumatic tire having an outer circumferential tread adapted to be ground contacting, where said tread is prepared from a sulfur curable elastomeric composition comprised of, based on 100 parts by weight rubber (phr), (A) about 20 to about 60 phr medium vinyl polybutadiene rubber having about a 30 to about 55 percent vinyl content, (B) about 10 to about 50 phr cis 1,4-polyisoprene rubber and (C) about 30 to about 70 phr of at least one rubber selected from the group consisting of styrene/butadiene copolymer prepared by aqueous emulsion polymerization and styrene/butadiene copolymer prepared by organic solution polymerization, where said medium vinyl polybutadiene rubber, in its unvulcanized state has an ML4(100° C.) in the range of about 40 to about 120.

4,530,960
LOW TEMPERATURE CURE, ACTIVATED ESTER COATING COMPOSITION WITH IMPROVED POT LIFE

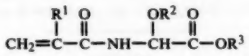
David A. Ley, Stamford, Conn., and Susan M. Cady, Yardley, Pa., assignors to American Cyanamid Co., Stamford, Conn.

Filed Sep. 6, 1983, Ser. No. 529,235

Int. Cl.[3] **C08J** *39/00;* **C08K** *39/00*

U.S. Cl. 524—555 **19 Claims**

1. A low temperature cure, two component coating composition comprising, when the two components are mixed together, (a) a crosslinkable, solvent borne, solution polymer containing from about 1 to 100 weight percent of repeating units derived from an activated ester-containing vinyl monomer of the formula



wherein the R^1 group is selected from H and CH_3, the R^2 group is selected from alkyls of 1–6 carbon atoms, cycloalkyls of 5–6 carbon atoms, and 2-hydroxyalkyls of 2–6 carbon atoms, and the R^3 group is selected from alkyls of 1–6 carbon atoms, cycloalkyls of 5–6 carbon atoms, and 2-hydroxyalkyls of 2–6 carbon atoms; with any balance of repeating units derived from one or more copolymerizable ethylenically unsaturated comonomers; in admixture with (b) a hemiaminal made from a hemiaminal-forming, volatile ketone, and a crosslinking agent having a plurality of primary amine groups, each capable when in the free amine form, of replacing the OR^3 moiety by nucleophilic substitution, the hemiaminal being present in an amount sufficient to produce a crosslinked polymer when the primary amine groups of said crosslinking agent are in said free amine form.

4,530,961

LOW VISCOSITY STABLE AQUEOUS DISPERSION OF GRAFT CARBON BLACK

Van T. Nguyen, Cruseilles, France; Günter Bellmann, Commugny, Switzerland, and Francoise Boussel, Saint-Julien en Genevois, France, assignors to Battelle Memorial Institute, Geneva, Switzerland

PCT No. PCT/EP83/00175, § 371 Date Mar. 9, 1984, § 102(e) Date Mar. 9, 1984, PCT Pub. No. WO84/00372, PCT Pub. Date Feb. 2, 1984

PCT Filed Jul. 6, 1983, Ser. No. 598,351

Claims priority, application France, Jul. 9, 1982, 82 810295

Int. Cl.[3] C09D *11/02, 11/10*

U.S. Cl. 524—832 22 Claims

1. A stable aqueous dispersion or suspension of carbon black the particles of which are grafted with chemically bonded water soluble polyolefinic chain residues selected from alkali metal and ammonium polyacrylates the dispersed carbon black solid content of which is from about 5 to 15% by weight and the viscosity is from about 2 to 30 cP at room temperature.

4,530,962

ELASTOMER MODIFIED UNSATURATED POLYMERS

Ian J. Alexander, Wellingborough, England, assignor to Scott Bader Company Limited, Wellingborough, United Kingdom

Filed Nov. 9, 1982, Ser. No. 440,345

Claims priority, application United Kingdom, Nov. 10, 1981, 81 33921

Int. Cl.[3] C08K *3/40;* C08L *63/08, 63/10, 67/06*

U.S. Cl. 525—31 10 Claims

1. A heterogeneous elastomer-modified unsaturated polymer comprising (a) an unsaturated polymer selected from unsaturated polyesters and unsaturated epoxy acrylate polymers, the polymer (a) being modified by about 2.5 to 20% of a modifying polymer, which modifying polymer is the reaction product of (b) a low molecular weight elastomer comprising a diene having terminal functional groups and (c) a low molecular weight epoxy resin capable of reaction with said terminal functional groups, which epoxy resin (c) provides terminal groups of the modifying polymer which render the modifying polymer compatible with the unsaturated polymer (a).

4. A resin composition comprising a heterogeneous elastomer-modified unsaturated polymer, which heterogeneous elastomer-modified unsaturated polymer comprises (a) an unsaturated polymer selected from unsaturated polyesters and unsaturated epoxy acrylate polymers, the polymer (a) being modified by about 2.5 to 20% of a modifying polymer, which modifying polymer is the reaction product of (b) a low molecular weight elastomer comprising a diene and having terminal functional groups and (c) a low molecular weight epoxy resin capable of reaction with said terminal functional groups, which epoxy resin (c) provides terminal groups of the modifying polymer which render the modifying polymer compatible with the unsaturated polymer (a), and (d) a cross-linking agent capable of cross-linking with the unsaturated polymer (a).

4,530,963

INSOLUBLE CHELATING COMPOSITIONS

Irving W. DeVoe, Baie d'Urfe, and Bruce E. Holbein, Pointe-Claire, both of Canada, assignors to Devoe-Holbein International, N.V., Curacao, Netherlands Antilles

Continuation-in-part of Ser. No. 417,376, Sep. 13, 1982, abandoned. This application Feb. 24, 1983, Ser. No. 469,431

Claims priority, application Canada, Aug. 20, 1982, 409869

Int. Cl.[3] B07C *5/36;* B07B *13/05*

U.S. Cl. 525—54.1 16 Claims

1. An insoluble composition comprising a member selected from the class consisting of

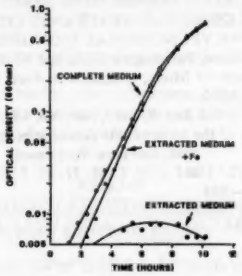
(A) an insoluble composition comprising

(1) one or more organic chelating compounds, covalently fixed to the surface of

(2) a suitable insoluble carrier, said organic chelating compounds possessing one or more coordinating sites, said organic chelating compounds being selected from the class consisting of microbial siderophores and

(B) an insoluble composition comprising

(1) one or more catechol compounds covalently fixed to the surface of



(2) a suitable insoluble carrier, said catechol compounds being covalently fixed to the surface of said carrier at the benzene ring thereof, said catechol compounds being selected from the group consisting of catechol substituted on the benzene ring by one or two electrophilic substituents.

4,530,964

PHARMACEUTICALLY ACTIVE COPOLYMERS, PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Raymund Machovich; Miklós Nagy; Judit Györgyi née Edelényi; István Horváth; Miklós Lőw; Katalin Csomor; Egon Kárpáti; László Szporny, and Lajos Kisfaludy, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar R.T., Budapest, Hungary

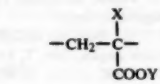
Filed Mar. 24, 1983, Ser. No. 478,468

Claims priority, application Hungary, Mar. 31, 1982, 974/82

Int. Cl.[3] C08F *228/02*

U.S. Cl. 525—61 5 Claims

1. A copolymer having a polymerization degree of 50 to 3000 comprising units of the formula I

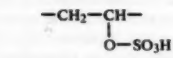


I

wherein

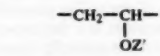
X is hydrogen or methyl,

Y is hydrogen, units of the formula III



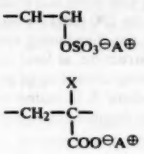
III

units of the formula II



II

wherein Z' is hydrogen, and chain terminating units, formed from the units of formulae I, III and II under the conditions of copolymerization, in a statistical arrangement, or a pharmaceutically acceptable salt thereof, wherein the salts contain, in addition to the above units, units of the formula IV and/or V



wherein A is a cation.

4,530,965

POLYMERIC MOLDING COMPOSITION CONTAINING STYRENIC COPOLYMER, POLYCARBONATE AND MBS POLYMER

Larry G. Bourland, Downingtown, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 10, 1984, Ser. No. 578,941
Int. Cl.[3] C08L *69/00*
U.S. Cl. 525—67 13 Claims

1. A polymeric molding composition which comprises a blend of (A) a polycarbonate resin, (B) a copolymer of (B.1) a vinyl aromatic monomer and (B.2) an α,β unsaturated cyclic anhydride; and, (C) a core-shell copolymer in which said core is about 90 to 50 parts by weight of polybutadiene or a copolymer of butadiene with up to 50 percent, of at least one monomer selected from the group consisting of styrene, lower alkyl methacrylates, lower alkyl acrylates, acrylonitrile and olefins, and in which said shell is about 10 to 50 parts of a lower alkyl methacrylate or a copolymer of a lower alkyl methacrylate with up to 50 percent of at least one monomer selected from the group consisting of styrene, acrylonitrile, and lower alkyl acrylates wherein the polymerization of the (B.1) and the (B.2) is carried out in the presence of a first and a second impact modifier, wherein the first impact modifier is a conjugated diene/styrenic copolymer containing 65% by weight or more butadiene, isoprene or a mixture thereof and the second impact modifier is a vinyl aromatic monomer/conjugated diene copolymer containing from about 10 to about 60% by weight conjugated diene.

4,530,966

PROCESS FOR CONTINUOUSLY POLYMERIZING A BLOCK COPOLYMER AND THE BLOCK COPOLYMER MIXTURE OBTAINED THEREFROM

Toshinori Shiraki, Yamato, Japan; Akio Yamori, Victoria, Australia, and Hideo Morita, Yokohama, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 296,955, Aug. 27, 1981, abandoned. This application Jun. 30, 1983, Ser. No. 509,666
Claims priority, application Japan, Sep. 6, 1980, 55-122951; Sep. 6, 1980, 55-122952; Sep. 6, 1980, 55-122953
The portion of the term of this patent subsequent to Jul. 23, 2002, has been disclaimed.
Int. Cl.[3] C08F *297/04*
U.S. Cl. 525—89 26 Claims

1. A process for continuously preparing a block copolymer comprising at least two polymer blocks composed mainly of an aromatic vinyl hydrocarbon and at least one polymer block composed mainly of a conjugated diene in an inert hydrocarbon solvent composed mainly of an aromatic hydrocarbon or alicyclic hydrocarbon comprising the steps of:

(a) batchwise preparing a prepolymer containing at least one aromatic vinyl hydrocarbon polymer block having a number-average molecular weight of at least 5000 and a weight-average molecular weight to number-average molecular weight ratio of less than 1.5 by using a portion of monomers to be formed into the block copolymer in the presence of an organic lithium compound as a catalyst; and, then,

(b) continuously preparing the block copolymer in at least one polymerization vessel, arranged in a continuous polymerization zone for continuously polymerizing the remainder of the monomers, by continuously supplying the prepolymer to the first polymerization vessel and simultaneously supplying the remainder of the monomers in the form of at least one monomer group selected from the group consisting of a monomer group composed mainly of the aromatic vinyl hydrocarbon and a monomer group composed mainly of the conjugated diene continuously and separately, to the subsequent polymerization vessel or vessels.

4,530,967

PROCESS FOR CONTINUOUSLY POLYMERIZING A BLOCK COPOLYMER AND THE BLOCK COPOLYMER MIXTURE OBTAINED THEREFROM

Toshinori Shiraki, Yamato, Japan; Akio Yamori, Victoria, Australia, and Hideo Morita, Yokohama, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 296,955, Aug. 27, 1981, abandoned. This application Jun. 30, 1983, Ser. No. 509,670
Claims priority, application Japan, Sep. 6, 1980, 55-122951; Sep. 6, 1980, 55-122952; Sep. 6, 1980, 55-122953
The portion of the term of this patent subsequent to Jul. 23, 2002, has been disclaimed.
Int. Cl.[3] C08F *297/04*
U.S. Cl. 525—89 26 Claims

1. A process for continuously preparing a block copolymer comprising at least two polymer blocks composed mainly of an aromatic vinyl hydrocarbon and at least one polymer block composed mainly of a conjugated diene in an inert hydrocarbon solvent composed mainly of an aliphatic hydrocarbon comprising the steps of:

(a) batchwise preparing a prepolymer containing 75% by weight or less of at least one aromatic vinyl hydrocarbon polymer block having a number-average molecular weight of at least 5000 and a weight-average molecular weight to number-average molecular weight ratio of less than 1.5 by using a portion of monomers to be formed into the block copolymer in the presence of an organic lithium compound as a catalyst; and, then,

(b) continuously preparing the block copolymer in at least one polymerization vessel, arranged in a continuous polymerization zone for continuously supplying the prepolymer to the first polymerization vessel and simultaneously supplying the remainder of the monomers in the form of at least one monomer group selected from the group consisting of a monomer group composed mainly of the aromatic vinyl hydrocarbon and a monomer group composed mainly of the conjugated diene continuously and separately, to the subsequent polymerization vessel or vessels.

4,530,968

POLYMER BLEND COMPOSITION EXHIBITING IMPACT RESISTANCE

Gregory M. Swisher, and Ronald D. Mathis, both of Suite 1107, 1825 K St. NW., Washington, D.C. 20006

Filed Jun. 19, 1984, Ser. No. 622,312
Int. Cl.[3] C08L *27/06, 53/02*
U.S. Cl. 525—96 4 Claims

1. A composition comprising (a) resinous, non-elastomeric block copolymer of a conjugated diene and a vinylarene and (b) polyvinylchloride sufficient to provide synergistic notched Izod impact strength wherein the resinous, non-elastomeric block copolymer of a conjugated diene and a vinylarene is present in an amount of about 99 to about 50 weight percent of the total composition and the polyvinylchloride is present in an amount of about 1 to about 50 weight percent of the total composition.

4,530,969

CO-VULCANIZABLE COMPOSITIONS BASED ON FLUORELASTOMERS AND POLYMERIC COMPOUNDS WITH A PERFLUOROETHERIC STRUCTURE

Giovanni Moggi; Luciano Flabbi, both of Milan, and Ezio Strepparola, Treviglio, all of Italy, assignors to Montedison S.p.A., Milan, Italy

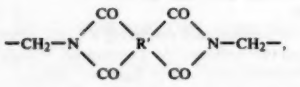
Filed Jul. 6, 1983, Ser. No. 511,263
Claims priority, application Italy, Jul. 7, 1982, 22272 A/82
Int. Cl.[3] C08L *15/02, 27/08, 71/00, 77/00*
U.S. Cl. 525—180 6 Claims

1. An elastomeric composition vulcanizable with peroxides, consisting of a fluoroelastomer based on vinylidene fluoride containing small quantities of brominated or iodinated olefin as a comonomer with the function of vulcanization point, admixed with a quantity of from 1% to 25% by weight of polymeric perfluoropolyether consisting of repeating units represented by general formula:

$$-CF_2O(CF_2O)_n-(CF_2CF_2O)_m-CF_2Q-$$

wherein: n and m are integers from 2 to 100, the sum n+m is comprised between 5 and 200 while the m/n ratio is comprised between 0.2 and 1.5, and where Q is a bivalent radical selected from the group consisting of

$$-CO-NH-R-NH-CO-,$$



and

$$-CH_2-O-R-O-CH_2-,$$

wherein: R is a bivalent radical selected from the group consisting of

(a) alkylenes containing from 2 to 20 carbon atoms;
(b) cycloalkylenes containing from 5 to 10 carbon atoms and such cycloalkylenes containing alkyl substituents;
(c) heterocyclic radicals having a ring of 5 or 6 atoms; and
(d) arylene or alkylarylene radicals having one or more benzene rings and such radicals in which benzene rings are linked to each other by O or S atoms or by —CO—, —SO—, —NH— or $—SO_2—$, or by alkylene groups,

and R′ is an aliphatic, or aromatic or alicyclic tetravalent radical containing from 2 to 20 carbon atoms, said polymeric perfluoropolyether being further characterized by an inherent viscosity, measured in a concentration of 0.3% by weight, at 20° C., in a solvent mixture of $CF_2Cl—CFCl_2$/dimethylformamide in a volumetric ratio of 4:1, comprised between 0.2 and 0.9 dl/g.

4,530,970

FLUOROELASTOMER COMPOSITION AND LINING MATERIAL MADE THEREOF

Mitsuharu Morozumi; Yasumichi Ito, both of Yokohama; Takeshi Hiramatsu, Hohfu, and Minoru Asai, Yamaguchi, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Mar. 20, 1984, Ser. No. 591,494
Claims priority, application Japan, Apr. 1, 1983, 58-55303
Int. Cl.[3] C08L *15/02, 27/12, 27/16, 27/18*
U.S. Cl. 525—193 4 Claims

1. A fluoroelastomer composition comprising a fluoroelastomer and a polyvinylidene fluoride, wherein

(a) the fluoroelastomer is a peroxide-curable fluorinated copolymer elastomer,
(b) the polyvinylidene fluoride is a fine powder having an average particle size of at most 20 μm, and the composition contains a peroxide and about 0.2 to 20 polyallyl monomer as essential ingredients; wherein the amounts of the polyvinylidene fluoride, the peroxide and the allyl compound are from 30 to 300 parts by weight, from 0.1 to 10 parts by weight and from 0.2 to 20 parts by weight, respectively, based on 100 parts by weight of the fluoroelastomer; wherein the fluorinated copolymer elastomer has, in its polymer structure, at least one kind of cure site selected from the group consisting of an unsaturated bond, a $—CF_2X$ group where X is iodine or bromine, a CFX group where X is as defined above and a $—CH_3$ group.

4,530,971

COVULCANIZABLE COMPOSITIONS FROM FLUOROELASTOMERS BASED ON VINYLIDENE FLUORIDE AND COPOLYMERS TETRAFLUOROETHYLENE-PROPYLENE

Sergio Geri; Giovanni Moggi, and Carlo Laganà, all of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Sep. 6, 1984, Ser. No. 647,749
Claims priority, application Italy, Sep. 7, 1983, 22797 A/83
Int. Cl.[3] C08L *27/22, 27/16, 27/18, 27/20*
U.S. Cl. 525—199 1 Claim

1. Composition of elastomers suitable to be vulcanized, comprising:

(a) a fluoroelastomer based on vinylidene fluoride (40–83% by moles), perfluoropropene (15%–35%) and tetrafluoroethylene (0%–30%), in an amount equal to 42%–70% by weight of the total elastomeric composition;
(b) an amino compound suitable for vulcanizing fluoroelastomers selected from the group comprising the Schiff bases or the diamine carbamates, in an amount equal to 1–4% by weight of the total composition;
(c) a copolymer of tetrafluoroethylene (40%–60% by moles) and of propylene (60%–40%) in an amount equal to 51–22% by weight of the whole;
(d) an organic peroxide as vulcanizing agent, in an amount equal to 0.4–5% by weight of the whole.

4,530,972

FLUORIDE-CONTAINING POLYMER AND COMPOSITION CONTAINING SAME

Masayoshi Tatemoto, Ibaraki; Yasuyoshi Furukawa, Neyagawa; Masayasu Tomoda; Masahiko Oka, both of Otsu, and Shigeru Morita, Settsu, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Continuation of Ser. No. 121,533, Feb. 14, 1980, abandoned.
This application Sep. 30, 1982, Ser. No. 428,703
Claims priority, application Japan, Feb. 14, 1979, 54-16323
Int. Cl.[3] C08F *214/16*
U.S. Cl. 525—276 5 Claims

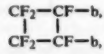
1. A fluorine-containing polymer substantially comprising: monomeric units of (A), at least one fluorine-containing olefin of the formula:

$$CF_2=CXY$$

wherein X is a hydrogen atom or a fluorine atom and Y is a hydrogen atom, a chlorine atom, a fluorine atom, a trifluoromethyl group, a difluoromethyl group, a C_1–C_3 perfluoroalkoxy group or a group of the formula:

$$-(CF_2)_mCOOM$$

wherein m is an integer of 0 to 3 and M is a hydrogen atom, a C_1–C_4 alkyl group, a sodium atom or a potassium atom but when X is a hydrogen atom, Y is always a hydrogen atom; monomeric units of (B), at least one C_4–C_8 fluorine-containing diene(s) of the formula $b—(CF_2)_n—b$, $b—(CF_2O)_x—(CF_2CF_2O)_y—(CF_2CF(CF_3)—O)_z—CF_2—b$ or



wherein b is the same or a different group of the formula CF_2=CF—, CF_2=CH— or CF_2=CFO—, n is an integer of 0 to 4, x is an integer of 0 to 3, y is an integer of 0 or 1 and z is an integer of 0 or 1, and x, y and z satisfy the relationship:

$$0<x+2y+3z+1\leqq 4$$

but when n=0, z is other than the group of the formula CF_2=CFO—; (C), at least one iodine atom; and (D), at least one unsaturated —C_1–C_8— fluoro or chlorofluorohydrocarbon group, the molar ratio of the diene (B) and the olefin (A) being from 1×10^{-4} to 5×10^{-2}, the iodine atom (C) being from 0.001 to 10% by weight based on the weight of the polymer and being bonded mainly to the end carbon atom(s) and the molar ratio of the group (D) and the olefin (A) being from 1×10^{-5} to 5×10^{-2}, said fluorine-containing polymer being produced by the process comprising the steps of polymerizing the component (A) in the presence of a radical producing source, excluding antinic ultraviolet light, and an iodine compound in which one or more of said iodine atoms (C) are bonded to said saturated or unsaturated fluoro or chlorofluorohydrocarbon group (D) and then further polymerizing with component (B) in the presence of the resulting product from the first polymerization.

4,530,973

TRANSPARENT IMPACT RESISTANT POLYMERIC COMPOSITIONS AND PROCESS FOR THE PREPARATION THEREOF

Robert A. Koster, and Tom D. Traugott, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 11, 1983, Ser. No. 474,613

Int. Cl.³ C08F *279/06, 287/00*

U.S. Cl. 525—310 **12 Claims**

1. A process for preparing transparent polymeric compositions comprising (i) a matrix polymer consisting essentially of from greater than about 40 to about 50 percent by weight monovinylidene aromatic monomer and from about 50 to about 60 percent by weight acrylate monomer copolymerized therein, both percents by weight being based on the weight of monovinylidene aromatic and acrylate monomers in the matrix polymer and (ii) dispersed occlusion-containing particles of diene-monovinylidene aromatic block copolymer, in which process a feed stream comprising an elastomeric diene-monovinylidene aromatic block copolymer which is dissolved in a solvent solution is added to an agitated polymerization system, in which polymerization system there is a reaction mixture comprising one or more monovinylidene aromatic monomers and one or more acrylate monomers which are being polymerized, said reaction mixture being prepared by

(a) providing to the beginning of an agitated plug-flow polymerization system from about 15 to about 40 parts by weight monovinylidene aromatic monomer, from about 30 to about 70 parts by weight acrylate monomer and from about 0.02 to about 0.2 part by weight of a mercaptan chain transfer agent; and

(b) polymerizing the monomers provided under an effective amount of shearing agitation to provide the desired reaction mixture,

the elastomer feed stream addition being to a point in the polymerization system where the added block copolymer is dispersed as discrete particles in the reaction mixture, such particles having a volume average particle diameter of from about 2 to about 5 microns.

4,530,974

NONTHROMBOGENIC ARTICLES HAVING ENHANCED ALBUMIN AFFINITY

Mark S. Munro, Anna, Tex.; Alfred J. Quattrone, Westlake, Calif.; Steven R. Ellsworth, and Robert C. Eberhart, both of Dallas, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 245,259, Mar. 19, 1981, abandoned. This application Jul. 13, 1982, Ser. No. 397,885

Int. Cl.³ C08G *69/46, 63/70, 78/82;* **C08F** *8/02*

U.S. Cl. 525—329.4 **22 Claims**

1. A nonthrombogenic article adapted for use in contact with blood or blood products containing albumin, said article having on those surfaces which contact blood or blood products a water soluble, biocompatible, nonionic polymeric substrate having covalently attached thereon nonionic, aliphatic hydrocarbon extensions of 14 to 20 carbon atoms, the degree of aliphatic extension attachment effective to absorb albumin sufficient to retard thrombus formation on said surfaces.

4,530,975

POLYAMIDE-IMIDE RESIN COMPOSITION

Yoshiyuki Mukoyama, Hitachi; Touichi Sakata, Katsuta, and Yuichi Osada, Hitachi, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Division of Ser. No. 186,746, Sep. 12, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 429,539

Int. Cl.³ C08L *79/08*

U.S. Cl. 525—423 **11 Claims**

1. A polyamide-imide resin composition comprising

(A) a polyamide-imide resin produced by reacting in a cresol, phenol or xylenol solvent a polyisocyanate containing one or more isocyanurate rings, an aromatic diisocyanate, a lactam and a polycarboxylic acid containing at least one acid anhydride group, and

(B) at least one member selected from the group consisting of

(i) an alkoxy modified amino resin,

(ii) a polyisocyanate containing one or more isocyanurate rings,

(iii) a phenol-formaldehyde resin,

(iv) an epoxy resin,

(v) a polyester resin having one or more hydroxyl groups obtained by using terephthalic acid and/or isophthalic acid as an acid component, and

(vi) at least one metal salt of Sn, Mn, Co and/or Zn.

4,530,976

FLEXIBLE UNI-BASECOAT/TWO COMPONENT CLEARCOAT COATING COMPOSITIONS

Panagiotis I. Kordomenos, Mt. Clemens; Kenneth R. Kurple, Anchorville, and Delores J. Alexander, Southfield, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US83/01604, § 371 Date Oct. 13, 1983, § 102(e) Date Oct. 13, 1983, PCT Pub. No. WO85/01737, PCT Pub. Date Apr. 25, 1985

PCT Filed Oct. 13, 1983, Ser. No. 598,551

Int. Cl.³ C08L *75/06*

U.S. Cl. 525—440 **20 Claims**

1. A flexible basecoat/clearcoat coating composition, useful as automotive finish coats on metal and plastic substrates, which is characterized in that the basecoat composition and the clearcoat composition each independently comprises:

(A) hydroxy-containing urethane modified polyester (i) having a number average molecular weight (M_n) of between about 1000 and about 10,000, (ii) having a hydroxyl number of between about 30 and about 200, and (iii) containing between about 1 and about 10 urethane groups per molecule, and being made from reactants comprising:

(1) urethane modified diol made by reacting: (a) diol, and (b) diisocyanate, wherein said diol and said diisocyanate

are reacted in a molar ratio of from about 4:1 to about 4:3;

(2) polyol comprising at least about 5 weight percent triol; and

(3) acid component selected from dicarboxylic acids and anhydrides thereof; and

(B) crosslinking agent; and

(C) 0–60 weight percent, based on the total weight of (A) and (B) of the composition, of a linear polyurethane having a number average molecular weight of between about 15,000 and about 40,000, and

wherein said crosslinking agent of said clearcoat composition is a polyisocyanate crosslinking agent and said crosslinking agent of said basecoat composition is an amine-aldehyde crosslinking agent, and wherein said basecoat composition additionally comprises pigment.

4,530,977
LOW TEMPERATURE-CURING POLYESTER URETHANE SYSTEMS

Ronald J. Lewarchik, Arlington Heights; Gerry K. Noren, Hoffman Estates; Ronald Metcalfe, Addison; Demetrius J. Bonin, Oak Park, and Erwin S. Poklacki, Arlington Heights, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Jul. 30, 1984, Ser. No. 636,020

Int. Cl.³ C08G *18/10, 18/32, 63/76*

U.S. Cl. 525—443 **13 Claims**

1. An hydroxy-functional polyurethane resinous reaction product of an organic diisocyanate with a stoichiometric excess of an essentially linear hydroxy-functional polyester, said polyester being the polyesterification reaction product of C_4–C_{10} aliphatic dicarboxylic acid or anhydride thereof with a stoichiometric excess of C_3–C_8 aliphatic diol providing an alcohol/acid molar ratio of 3/2 to 6/5, said polyester having an acid number of less than 10, and said diisocyanate being used in an amount providing an NCO/OH ratio of from ½ to 12/13.

8. A thermosetting solution coating composition which cures at low baking temperature to form a flexible film comprising organic solvent having dissolved therein from 5–50% of total resin solids of a partially methylolated melamine, and an hydroxy-functional polyurethane reaction product of an aliphatic diisocyanate with a stoichiometric excess of an essentially linear hydroxy-functional polyester, said polyester being the polyesterification reaction product of C_4–C_{10} aliphatic dicarboxylic acid or anhydride thereof with a stoichiometric excess of C_3–C_8 aliphatic diol providing an alcohol/acid molar ratio of 3/2 to 6/5, said polyester having an acid number of less than 10, and said diisocyanate being used in an amount providing an NCO/OH ratio of from ½ to 12/13.

4,530,978
SURFACE COATING BINDER CONTAINING BLOCKED ISOCYANATE GROUPS

Juergen Gimpel, Ludwigshafen; Volker Schwendemann, Wiesenbach, and Erich Gulbins, Heidelberg, all of Fed. Rep. of Germany, assignors to Basf Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 13, 1983, Ser. No. 531,657

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1982, 3234491

Int. Cl.³ C08F *283/00;* **C08G** *59/14*

U.S. Cl. 525—528 **8 Claims**

1. A surface coating binder based on a copolymer which contains tertiary amino groups, blocked isocyanate groups, hydroxyl groups and ether groups, is water-soluble or water-dispersible as a result of partial or complete salt formation with an acid, and can be used as a self-crosslinking or externally crosslinking binder for the cathodic electrocoating of metal articles, wherein the copolymer contains, as copolymerized units,

(A) from 6 to 22% by weight of one or more olefinically unsaturated compounds which contain a tertiary amino group,

(B) from 10 to 35% by weight of an N-(1-alkenyl)isocyanate which is blocked by means of a CH-, OH- or NH-acidic blocking agent,

(C) from 30 to 60% by weight of an adduct obtained from

(a) an epoxy resin based on bisphenol A and epichlorohydrin and having a molecular weight of from 300 to 3,500,

(b) a polymerizable, olefinically unsaturated carboxylic acid of 3 to 20 carbon atoms and

(c) a secondary amine, with or without

(d) a saturated aliphatic monocarboxylic acid of 1 to 20 carbon atoms, with the proviso that from 10 to 50 mole % of the epoxide groups of the component (a) are esterified with the polymerizable, olefinically unsaturated monocarboxylic acid (b), from 10 to 50 mole % of the expoxide groups of the component (a) have been reacted with the secondary amine (c), and up to 80 mole % of the expoxide groups of the component (a) are esterified with the aliphatic monocarboxylic acid (d), and

(D) from 0 to 54% by weight of one or more copolymerizable, olefinically unsaturated compounds not mentioned under (A), (B) or (C), with the proviso that the copolymer has a mean molecular weight of from 1,000 to 20,000 and the sum of percentages stated under (A), (B), (C), and (D) is 100.

4,530,979
CONTINUOUS POLYMERIZATION OF WATER-MISCIBLE POLYMERS

James R. Birch, Midland, Mich., assignor to The Dow Company, Midland, Mich.

Filed Jun. 15, 1983, Ser. No. 504,762

Int. Cl.³ C08F *2/16*

U.S. Cl. 526—64 **7 Claims**

1. A continuous adiabatic process for preparing water-miscible high molecular weight polymers which comprises passing an aqueous solution containing a water-miscible monomer mixture together with suitable initiators through a reactor, said monomer mixture being sufficiently reactive as to effect a rapid increase in viscosity as said monomer mixture is subjected to conditions sufficient to polymerize the monomer in the reactor, thereby forming the desired polymer product which exhibits consistent cross-sectional properties in the reactor over time, wherein said product so formed is in the form of a gel and moves consistently and easily through the reactor as a plug.

4,530,980
METHOD OF COPOLYMERIZATION IN SUSPENSION OF ETHYLENE WITH STRAIGHT-CHAIN ALPHA-OLEFINS TO OBTAIN LOW-DENSITY COPOLYMERS

Pierino Radici, Turate, Italy, assignor to Societa Italiana Resine S.T.R. S.p.A. and Enichimica Secondaria S.p.A, both of, Italy

Filed Feb. 10, 1984, Ser. No. 579,052

Claims priority, application Italy, Feb. 10, 1983, 19521 A/83

Int. Cl.³ C08F *2/00*

U.S. Cl. 526—73 **4 Claims**

1. A method of copolymerization in suspension of a liquid aliphatic hydrocarbon reaction medium containing 6 to 8 carbon atoms, gaseous ethylene and at least one alpha-olefin having 3 to 8 carbon atoms to obtain copolymers having a density below 0.940 g/ml, wherein copolymerization is carried out in the presence of a Ziegler catalyst carried on a solid, microspheroidal product obtained by spray drying a solution of magnesium chloride in ethanol or a mixture of ethanol and a higher boiling point solvent and having high catalytic activity, characterized in that:

(a) the gaseous ethylene, at least one alpha-olefin and catalyst are introduced into the reaction medium and a first

reaction step is carried out at a temperature between 45° and 65° at a pressure of 2 to 6 bars for 20 seconds to 30 minutes,

(b) the resulting copolymer suspension is then subjected to a second reaction step which is carried out at a temperature between 50° and 80° C. and at a pressure of 5 to 25 bars for between 1 and 3 hours, wherein the reaction medium is supplied with ethylene and alpha-olefin and, if required, with further quantities of solvent but not with further quantities for catalyst,

(c) the amount of alpha-olefin supplied during the first step is adjusted so as to maintain the concentration of alpha-olefin in the reaction medium at between 4% and 7% by weight,

(d) the amount of alpha-olefin supplied during the second reaction step is adjusted so as to maintain the concentration of alpha-olefin in the reaction medium at between 15% and 20% by weight,

(e) the copolymer obtained from the hydrocarbon suspension is recovered by conventional separation means and the product is dried without any process for destroying or eliminating the catalyst.

4,530,981

PROCESS FOR MAKING TETRAFLUOROETHYLENE FINE POWDER

Satish C. Malhotra, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 13, 1984, Ser. No. 639,943
Int. Cl.³ C08F *14/18, 14/26*
U.S. Cl. 526—73 **3 Claims**

1. A process for polymerizing tetrafluoroethylene in an aqueous medium in the presence of a substantially non-telogenic anionic surfactant present in an amount which maintains colloidal particles of polymerization product in dispersed form, said process being carried out by reacting tetrafluoroethylene in said aqueous medium in the presence of at least one tetrafluoroethylene polymerization initiator wherein the temperature at which polymerization is carried out is varied as follows:

(a) at the beginning of the polymerization the temperature is between 70°–90° C.,

(b) when between 5–30% of the total amount of tetrafluoroethylene has been polymerized, the temperature is raised to between 100°–125° C.,

(c) after 20–80% of the total tetrafluoroethylene has been polymerized and after step (b) has been carried out, the temperature is lowered by at least 30° C. from the temperature used in step (b).

4,530,982

POLYMERIZATION USING BENZENEDIAZONIUM TETRAFLUOROBORATE/TITANIUM TETRAHALIDE-BASED CATALYSTS

Robert M. Parlman, and Charles M. Selman, both of Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 525,517, Aug. 22, 1983, Pat. No. 4,487,844. This application Sep. 28, 1984, Ser. No. 655,610
Int. Cl.³ C08F *4/64, 10/00*
U.S. Cl. 526—115 **22 Claims**

1. A polymerization process comprising contacting at least one mono-1-olefin having 2 to 10 carbon atoms per molecule with a catalyst system produced by a process comprising:

(a) contacting a benzenediazonium tetrafluoroborate with a titanium tetrahalide to produce a catalyst component; and

(b) combining said catalyst component with a cocatalyst selected from at least one of organometal compounds and organoboron compounds.

4,530,983

PROCESS FOR POLYMERIZING ETHYLENE

Mitsuyuki Matsuura, Kameyama; Yoshiteru Kageyama, Yokkaichi; Akito Hagiwara, Yokkaichi, and Takeo Shimada, Yokkaichi, all of Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Jan. 18, 1983, Ser. No. 458,843
Claims priority, application Japan, Jan. 22, 1982, 57-8290
Int. Cl.³ C08F *4/02, 10/02*
U.S. Cl. 526—125 **10 Claims**

1. A process for copolymerizing ethylene, with an α-olefin, comprising bringing ethylene and an α-olefin into contact with a catalyst comprising a combination of the following components A, B, and C under the conditions of a pressure of at least 300 kg/cm², a temperature of at least 180° C., a contact time of 10 to 150 seconds, and substantial absence of a solvent, thereby to obtain a copolymer having a density of from 0.890 to 0.940 g/cm³ and comprising 3–20% by weight of the polymer of the α-olefin copolymerized:

a solid composition prepared by mixing and pulverizing the following compounds (1), (2), and (3):

(1) a magnesium dihalide

(2) titanium trichloride

(3) an oxygen containing electron donative organic compound;

Component B comprising:

an organoaluminum compound containing a halogen group of the formula $R_{3-m}AlX_m$ where R represents a hydrocarbon residue having 1 to 10 carbon atoms, X represents a halogen atom and $0<m<2$; and Component C comprising:

an organic acid ester of a mono- or di-carboxylic acid having 2 to 15 carbon atoms.

4,530,984

PROCESS FOR PRODUCTION OF POLYMERS HAVING INCREASED 1,2-MICROSTRUCTURE

James E. Hall, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

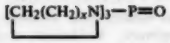
Division of Ser. No. 394,068, Jul. 1, 1982, Pat. No. 4,473,661. This application Apr. 2, 1984, Ser. No. 595,853
Int. Cl.³ C08F *4/48*
U.S. Cl. 526—177 **17 Claims**

1. A process for the preparation of a homopolymer of a 1,3-diene monomer said homopolymer containing a 1,2-microstructure ranging between about 20 and about 65 percent which process comprises polymerizing said 1,3-diene monomer in an inert non-polar solvent in the presence of a catalytically effective amount of a catalyst system comprising:

(a) at least one anionic initiator based on lithium, said anionic initiator being selected from the group consisting of substituted lithium amines, substituted lithium phosphines, lithium compounds having the formula ROLi wherein R represents a hydrocarbyl radical of 1 to 20 carbon atoms, lithium compounds having the formula $R(Li)_x$ wherein R represents a hydrocarbyl radical of 1 to 20 carbon atoms and x is an integer of 1-4,phenyllithium, naphthyllithium, 4-butylphenyllithium, p-tolyllithium, 4-phenylbutyllithium, 4-butylcyclohexyllithium, 4-cyclohexylbutyllithium, 1,4-dilithiobutane, 1, 10-dilithiodecane, 1,20-dilithioeicosane, 1,4-dilithiobenzene, 1,4-dilithionaphthalene, 9,10-dilithioanthracene, 1,2-dilithio-1,2-diphenylethane, 1,3,5-trilithiopentane, 1,5,15-trilithioneicosane, 1,3,5-trilithiocyclohexane, 1,3,5,8-tetralithiodecane, 1,5,10,20-tetralithioeicosane, 1,2,4,6-tetralithiocyclohexane, and 4,4'-dilithiobiphenyl,

(b) at least one compound selected from the group consisting of a dialkyl magnesium compound and a trialkyl aluminum compound, and

(c) a phosphine oxide modifier represented by the structural formula:



wherein x represents an integer of 3, 4 or 5, in which the temperature of polymerization initiation is at least 0° C. and in which the millimoles of the anionic initiator per 100 grams of the 1,3-diene monomer ranges between about 0.2 and about 100, the molar ratio of (b) to (a) ranges between about 0.01/1.0 to about 100/1.0, and the molar ratio of (c) to (a) ranges between about 0.05/1 to about 100.0/1.0.

4,530,985

PROCESS FOR THE PREPARATION OF POLYMERS COMPRISING CONJUGATED DIENES AND OPTIONALLY MONOALKENYL AROMATIC HYDROCARBONS

Antonius A. Broekhuis, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

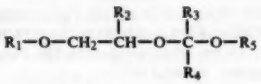
Filed Aug. 17, 1984, Ser. No. 641,637

Claims priority, application United Kingdom, Mar. 23, 1984, 8407629

Int. Cl.³ C08F *4/48*

U.S. Cl. 526—181 **11 Claims**

1. A process for the preparation of polymers comprising conjugated dienes and optionally monoalkenyl aromatic hydrocarbons, which process comprises polymerizing conjugated diene and optionally monoalkenyl aromatic hydrocarbon monomers in the presence of a hydrocarbon diluent, a hydrocarbyl alkalimetal compound and a Lewis base, wherein the Lewis base is a compound having the formula



and wherein

R_1 is an alkyl group having 2–18 carbon atoms;

R_2 and R_3 are hydrogen or an alkyl groups having 1–4 carbon atoms;

R_4 is hydrogen or an alkyl group having 1–6 carbon atoms; and

R_5 is an alkyl group having 1–18 carbon atoms.

4,530,986

ELASTOMERIC SULFONATE TERPOLYMERS AND PROCESS FOR FORMING THE SULFONATED TERPOLYMERS

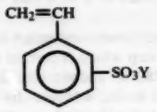
Robert A. Weiss, Storrs, Conn.; Robert D. Lundberg, Bridgewater, and Allen C. Werner, Chatham, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 326,544, Dec. 2, 1981, abandoned, which is a continuation-in-part of Ser. No. 278,423, Jun. 29, 1981, abandoned, which is a continuation of Ser. No. 117,197, Jan. 31, 1980, abandoned. This application May 19, 1983, Ser. No. 496,280

Int. Cl.³ C08F *228/02*

U.S. Cl. 526—240 **7 Claims**

1. A solid water insoluble elastomeric terpolymer comprising about 13 to about 48 weight percent of styrene, about 55 to 88 weight percent of butadiene and a minor proportion of a metal or amine neutralized sulfonate monomer characterized by the formula:



wherein Y is a cation selected from Groups I-A, II-A, I-B and II-B of the Periodic Table or an amine of the formula:

where R_1 and R_2 can be aliphatic groups of C_1 to C_{12} or hydrogen, said terpolymer being water insoluble, having at least about 20 to about 80 meq. of sulfonate groups per 100 grams of polymer, and having a reduced viscosity as measured in a solvent at a concentration of 10 gm/liter of greater than 0.7 and less than 5.0, wherein said sulfonate groups are affixed to the aromatic rings of said terpolymer said terpolymer not being able to form a latex in an aqueous solution.

4,530,987

SULFONATED COPOLYMERS AND PROCESS FOR FORMING THE SULFONATED COPOLYMERS

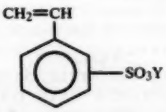
Robert D. Lundberg, Bridgewater, N.J.; Robert W. Lenz, Amherst, and Bernd Oster, Holden, both of Mass., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 326,531, Dec. 2, 1981, abandoned, which is a continuation-in-part of Ser. No. 117,199, Jan. 31, 1980, abandoned. This application Jun. 15, 1983, Ser. No. 504,681

Int. Cl.³ C08F *228/02*

U.S. Cl. 526—240 **6 Claims**

1. A solid water insoluble elastomeric co- or terpolymer comprising at least 80% by weight of at least one conjugated diene having from 4 to 12 carbon atoms and a minor proportion of a metal or amine neutralized sulfonate monomer characterized by the formula:



wherein Y is a cation selected from Groups IA, IIA, IB and IIB of the Periodic Table or an amine of the formula:

where R_1 and R_2 can be aliphatic groups of C_1 to C_{12} or hydrogen, said co- or terpolymer being water insoluble having about 20 to about 80 meq of sulfonate groups per 100 grams of polymer, wherein said sulfonate groups are affixed to the aromatic ring of said co- or terpolymer said co- or terpolymer not being able to form a latex in an aqueous solution.

4,530,988
ANAEROBIC ADHESIVES

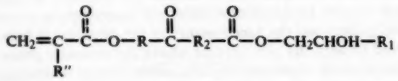
Gerhardt P. Werber, Naperville, Ill., assignor to Eschem Inc., Downers Grove, Ill.

Division of Ser. No. 265,539, May 20, 1981, Pat. No. 4,431,787, which is a continuation-in-part of Ser. No. 100,244, Dec. 4, 1979, abandoned, which is a division of Ser. No. 647,217, Jan. 7, 1976, Pat. No. 4,209,604. This application Feb. 2, 1984, Ser. No. 576,149

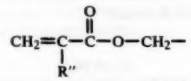
Int. Cl.[3] C08F *24/00, 2/00, 224/00*

U.S. Cl. 526—270 4 Claims

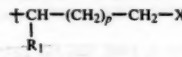
1. An anaerobic adhesive composition, comprising: an acrylic monomer having the general formula:



wherein R″ is a member selected from the group consisting of hydrogen, chlorine, methyl and ethyl radicals; R_2 is an unsaturated divalent alkyl or substituted alkyl group of from 2–4 carbon atoms, or an unsaturated divalent carbocyclic aliphatic ring of from 4–9 carbon atoms, R_1 is a member selected from the group consisting of hydrogen, methyl, ethyl, chloromethyl, methylol, phenyl, methoxyphenyl, methoxybutyl, methoxyallyl and



radicals where R″ is as previously defined; and R is



where p is an integer of from 0 to 2, q is an integer of from 1 to 3, R_1 is as previously defined, and X is a member selected from the group consisting of —O—, —NH—, —NR′— where R′ is a benzyl radical or an alkyl group of from 1–4 carbon atoms; said acrylic monomer being in combination with a metal activated polymerization catalyst and a polymerization inhibitor.

4,530,989
ROOM TEMPERATURE STABLE ORGANOPOLYSILOXANE COMPOSITIONS

Ulrich Michel, Burghausen, and Josef Radecker, Emmerting, both of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

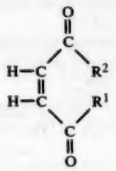
Filed Mar. 16, 1984, Ser. No. 590,314

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1983, 3315060

Int. Cl.[3] C08G *77/06*

U.S. Cl. 528—15 8 Claims

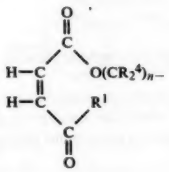
1. A crosslinkable organopolysiloxane composition comprising an organosilicon compound having Si-bonded hydrogen atoms, in organosilicon compound having aliphatic multiple bonds, a platinum catalyst capable of promoting the addition of the Si-bonded hydrogen atoms to the aliphatic multiple bonds and an inhibitor which delays or prevents crosslinking at room temperature which is selected from the group consisting of maleinimide and a maleic acid derivative selected from the group consisting of



and $R^6(SiR_2^7O)_x(SiR^7R^6O)_ySiR_2^7R_6$, where R^1 is selected from the group consisting of a hydroxyl group and a trimethylsiloxy group, R^2 is a radical selected from the group consisting of a hydrocarbonoxy radical which is bonded to the carbon atom of the

group and a hydrocarbonoxy radical which is bonded to the carbon atom of the

group and is substituted with at least one triorganosilyl group, at least one R^6 is a radical of the formula



and the other R^6 radicals are selected from the group consisting of the formula

$$-O(CR_2^4)_nOH$$

and R^7, where R^1 is the same as above, R^4 is selected from the group consisting of hydrogen and an alkyl radical having from 1 to 6 carbon atoms per radical, R^7 is selected from the group consisting of phenyl and alkyl radicals having 2 or 3 carbon atoms per radical and halogenated phenyl and alkyl radicals having 2 or 3 carbon atoms per radical, n is an integer having a value of from 3 to 19, x is 0 or an integer having a value of from 1 to 200 and y is an integer having a value of from 1 to 10.

4,530,990
PROCESS FOR THE PREPARATION OF VISCOSITY STABLE POLYURETHANE SOLUTIONS

Reinhard Halpaap; Josef Pedain, both of Cologne; Wilhelm Thoma, Leverkusen, and Jürgen Grammel, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 8, 1982, Ser. No. 433,596

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1981, 3142706

Int. Cl.[3] C08G *2/28, 18/08*

U.S. Cl. 528—53 5 Claims

1. A process for the prearation of predominantly linear polyurethanes which comprises:

(a) reacting

(A) an organic diisocyanate or diisocyanate mixture optionally containing small portions of a triisocyanate, with

(B) one or more polyhydroxyl compounds which are predominantly bifunctional and generally have molecular weights of from about 400 to 5000 and

(C) optionally one or more chain lengthening agents having at least two isocyanate reactive hydrogen atoms and molecular weights of from about 32 to 399,

wherein the proportion of isocyanate groups to the number of isocyanate-reactive hydrogen atoms is in the range of from about 0.9:1 to 1:0.9, and

(b) when the isocyanate content is less than about 0.4% by weight and the required viscosity has been reached, adding a monofunctional, low molecular weight oxime having a molecular weight from about 73 to 325 to the reaction mixture as monofunctional chain breaking agent in a quantity equivalent to or in excess of the equivalents of unreacted isocyanate groups.

4,530,991

LATENT CURING AGENTS FOR EPOXY RESINS

Kiyomiki Hirai, Kawasaki; Koji Takeuchi, Yokohama; Nobuo Ito, Oisomachi, and Masahiro Abe, Kawasaki, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Oct. 12, 1983, Ser. No. 541,022

Claims priority, application Japan, Oct. 12, 1982, 57-178868

Int. Cl.³ C08G *59/44*; C07C *109/097*

U.S. Cl. 528—123 **7 Claims**

1. A compound having the formula (I) or (II):

$$N—CH_2CH_2CONHNH_2)_3 \quad (I)$$

$$(NH_2NHCOCH_2CH_2—_2N—R—N—CH_2CH-_2CONHNH_2)_2 \quad (II)$$

wherein R is a divalent hydrocarbon residue having 2–24 carbon atoms.

3. A curable epoxy resin composition comprising (a) an epoxy resin having an average of more than one epoxy group per molecule and (b), as curing agent, a compound having the formula (I) or (II):

$$N—CH_2CH_2CONHNH_2)_3 \quad (I)$$

$$(NH_2NHCOCH_2CH_2—_9N—R—N—CH_2CH-_2CONHNH_2)_2 \quad (II)$$

wherein R is a divalent hydrocarbon residue having 2–24 carbon atoms.

4,530,992

AROMATIC OLIGOMERS AND RESINS

Michael E. B. Jones, Chester, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Dec. 6, 1983, Ser. No. 558,525

Claims priority, application United Kingdom, Dec. 6, 1982, 8234715; May 27, 1983, 8314707

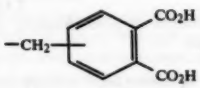
Int. Cl.³ C08G *10/02, 12/02*

U.S. Cl. 528—232 **14 Claims**

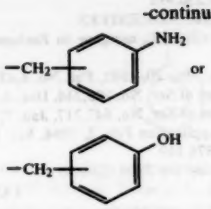
1. A composition comprising an oligomer, which may be linear or branched, which comprises the repeating unit

$$—(Ar^1—CHR)—$$

and which has pendant and/or terminal groups, which groups, which may be the same or different, are acyloxymethyl, hydroxymethyl, carboxyl,



-continued



wherein Ar^1 is an aromatic group, or a substituted derivative thereof, each of which may be the same or different; R, each of which may be the same or different, is hydrogen, or a hydrocarbyl group; and the functionality of the oligomer is between 0.5 and 10 with the proviso that where the aromatic group is a diphenyl oxide, diphenyl sulphide, dibenzofuran or dibenzothiophene residue, R is hydrogen and the pendant and/or terminal groups are acyloxymethyl and/or hydroxymethyl then the ratio of para-para linkages to ortho-para linkages as hereinbefore defined is less than 5:1.

10. A process for the preparation of oligomers as defined in claim 1 which process comprises at least the step of reacting an aromatic compound, an aldehyde and a carboxylic acid in the presence of a strong acid characterised in that the molar ratio of strong acid to aromatic compound is at least 1:1, with the proviso that where the carboxylic acid is a polymerisable olefinically unsaturated carboxylic acid the reaction is carried out at a temperature below 90° C.

4,530,993

POLY 2,2'-DICHLORO-4,4'-BIPHENYLENE PYROMELLITIMIDE FILM

Takuma Jinda, Shiga; Toshikazu Matsuda, Kusatsu, and Masanori Sakamoto, Ehime, all of Japan, assignors to Director General of Agency of Industrial Science & Technology, Tokyo, Japan

Filed Nov. 2, 1984, Ser. No. 667,729

Int. Cl.³ C08G *73/10*

U.S. Cl. 528—353 **3 Claims**

1. A polyimide film consisting essentially of 2,2'-dichloro-4,4'-biphenylene pyromellitimide units.

4,530,994

RUBBERY SOLID POLYMER OR COPOLYMER OF GLYCIDYL CARBOXYLATE AND COMPOSITION THEREOF

Yasumi Shimizu, Amagasaki, and Tetsuya Nakata, Ibaraki, both of Japan, assignors to Osaka Suda Co Ltd, Osaka, Japan

Filed Jun. 29, 1984, Ser. No. 626,027

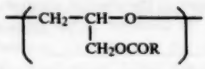
Claims priority, application Japan, Jun. 30, 1983, 58-119921; Jun. 30, 1983, 58-119922; Jun. 30, 1983, 58-119923; Dec. 7, 1983, 58-231765; Dec. 7, 1983, 58-231766

Int. Cl.³ C08G *65/08*

U.S. Cl. 525—403 **10 Claims**

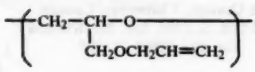
1. A rubbery solid polymer or copolymer of a carboxylic acid glycidyl ester, said polymer or copolymer having a reduced viscosity, determined at 80° C. for its 0.1% monochlorobenzene solution, of at least 0.5, and the main chain of said polymer or copolymer consisting of a repeating unit of formula (I), repeating units of formulae (I) and (II) in which the (I)/(II) mole ratio is 50-99/50-1, repeating units of formulae (I), (II) and (III) in which the (I)/(II)/(III) mole ratio is 1-90/1-10/3-40, repeating units of formulae (I), (II) and (IV) in which the (I)/(II)/(IV) mole ratio is 35-90/1-20/not less than 5, repeating units of formulae (I) and (III) in which the (I)/(III) mole ratio is 50-97/50-3, repeating units of formulae (I), (III) and (IV) in which the (I)/(III)/(IV) mole ratio is 35-90/5-60/not less than 5, or repeating units of formulae (I), (II), (III) and (IV) in which the (I)/(II)/(III)/(IV) mole ratio is 35-85/3-10/3-55/not less than 5, provided that when the main chain has

two or more repeating units, the total amount of the units is 100:

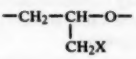


(I)

wherein R represents a saturated alkyl group having 1 to 4 carbon atoms,

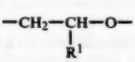


(II)



(III)

wherein X represents a halogen atom,



(IV)

wherein R^1 represents H or CH_3.

2. A curable composition composed of the rubbery solid polymer or copolymer of a carboxylic acid glycidyl ester as set forth in claim 1 and a curing agent.

4,530,995

METHODS FOR STORAGE OF GUAYULE PLANT MATERIAL

Richard Gutierrez, Canal Fulton; Edward L. Kay, and David J. Serbin, both of Akron, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 307,405, Oct. 1, 1981, Pat. No. 4,405,532. This application Jun. 30, 1983, Ser. No. 509,481

Int. Cl.³ C08C *2/00*

U.S. Cl. 528—930 **4 Claims**

1. A method of storing guayule and guayule-like plant material prior to processing which comprises mixing the material in communited form with at least one essentially water-free organic liquid selected from the group consisting of butanes, pentanes, hexanes, heptanes, octanes, nonanes, cyclopentane, cyclohexane, cycloheptane, benzene, toluene, xylenes and mixtures thereof, to form a slurry in which the material is protected from contact with oxygen and storing said slurry for at least about 24 hours, and wherein the slurry also contains at least one stabilizer against oxidation of guayule resin and/or rubber, said stabilizer being soluble in said organic liquid and a symmetrical or unsymmetrical para phenylene diamine of the general formula

R'RN—Ph—NRR'

wherein Ph is a phenylene group, each R is independently hydrogen or a hydrocarbyl group and each R' is independently a hydrocarbyl group.

4,530,996

BISAZO BLUE-BLACK DYE HAVING VINYLSULFONE TYPE FIBER-REACTIVE GROUP

Takashi Omura, Ashiya; Naoki Harada, and Yasuo Tezuka, both of Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

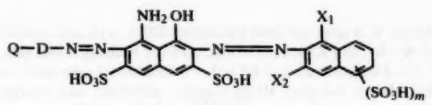
Filed Jun. 4, 1982, Ser. No. 384,889

Claims priority, application Japan, Jun. 15, 1981, 56-92674; Jul. 1, 1981, 56-103794; Dec. 16, 1981, 56-203994; Feb. 19, 1982, 57-26504

Int. Cl.³ C09B *62/503, 62/513;* **D06P** *1/38, 3/66*

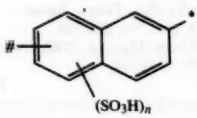
U.S. Cl. 534—642 **7 Claims**

1. A compound represented by a free acid of the formula:



wherein D is

(R_1 and R_2 independently represent hydrogen, methyl or methoxy or



(n is 0 or 1, the mark * signifies the position of linkage to —N=N— and the mark # signifies the position of linkage to Q mentioned below); Q is $—SO_2CH=CH_2$ or $—SO_2CH_2CH_2R$ (R is a group capable of being split off by the action of alkali), one of X_1 and X_2 is hydrogen and the other is a sulfonic acid group; and m is 0 or 1.

4,530,997

AZO DYES FROM SULFONATED 3-SULFONATED 3-AMINO-2,1-BENZISOTHIAZOLES WITH 1,2,3,4-TETRAHYDROQUINOLINE OR 2,3-DIHYDRO-1,4-BENZOXAZINE COUPLERS

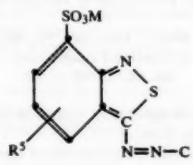
Max A. Weaver, and Ralph R. Giles, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 15, 1983, Ser. No. 475,566

Int. Cl.³ C09B *29/045, 29/039, 29/36, 29/44*

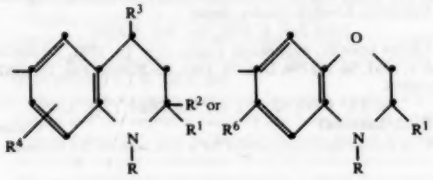
U.S. Cl. 534—768 **10 Claims**

1. A dye according to the formula:



wherein R^5 is 0–3 substituents independently selected from halogen, cyano, alkyl, alkoxy, alkylthio, alkylsulfonyl, sulfamoyl, alkylsulfamoyl, alkanoyloxy, carbamoyl, alkylcarbamoyl, alkoxycarbonyl, alkanoylamino, and SO_3M; M is selected from H^+, NH_4^+, Na^+, K^+, and the colorless cations of salts

of triethylamine, tri(2-hydroxyethyl)amine, di(2-hydroxyethyl-)amine, or N,N-dimethylaniline; C is a coupler having the formula



wherein R is selected from hydrogen, alkyl, aryl, and cycloalkyl; R^1, R^2, and R^3 are each selected from hydrogen and alkyl; R^4 is 0–2 substituents and R^6 is 0 or 1 substituent selected from alkyl, alkoxy, halogen, alkanoylamino, alkylthio, and aryloxy; and wherein the alkyl moieties of R, R^4, R^5 and R^6 are unsubstituted or substituted with 1–3 substituents independently selected from halogen, CN, OH, alkoxy, aryloxy, alkoxyalkoxy, alkanoyl, alkanoyloxy, carbamoyl, alkylcarbamoyl, sulfamoyl, alkylsulfamoyl, aryl, alkoxycarbonyl, alkoxyalkanoyloxy, and cycloalkyl.

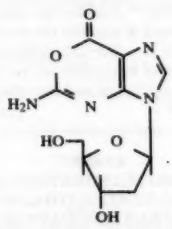
4,530,998

2'-DEOXYOXANOSINE

Hamao Umezawa; Tomio Takeuchi; Masaaki Ishizuka, all of Tokyo; Tomohisa Takita, Asaka; Nobuyoshi Shimada, Tokyo, and Kuniki Kato, Saitama, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku KenkyuKai, Tokyo, Japan

Filed Mar. 5, 1984, Ser. No. 586,348
Claims priority, application Japan, Mar. 14, 1983, 58-40802
Int. Cl.³ C07H *19/04*
U.S. Cl. 536—24 **1 Claim**

1. 2'-Deoxyoxanosine expressed by the following formula:



4,530,999

METHOD OF PRODUCING CELLULOSE CARBAMATE FIBERS OR FILMS

Johan-Fredrik Selin, Helsinki; Jouko Huttunen, Porvoo; Olli Turunen, Porvoo; Jan Fors, Porvoo; Vidar Eklund, Porvoo, and Kurt Ekman, Porvoo, all of Finland, assignors to Neste OY, Finland

Filed Nov. 1, 1984, Ser. No. 667,430
Claims priority, application Finland, Nov. 2, 1983, 834029
Int. Cl.³ C08B *15/06*
U.S. Cl. 536—30 **10 Claims**

1. In a method for producing cellulose carbamate fiber or film, comprising the steps of

reacting cellulose and urea at elevated temperature to form cellulose carbamate,

dissolving the thus-formed cellulose carbamate in an alkaline solution to prepare a spinning solution from which cellulose carbamate can be spun, and

spinning the thus-prepared solution through an acid precipitation solution to form fiber or film,

the improvement comprising the step of

irradiating the thus-formed cellulose carbamate with from about 0.05 to about 10 Mrad of radiation dose prior to dissolving the same in the alkaline solution, whereby the dissolvability of the cellulose carbamate is increased.

4,531,000

PROCESSES FOR THE PREPARATION OF BRANCHED, WATER SOLUBLE CELLULOSE PRODUCTS

Manssur Yalpani, Vancouver, Canada, assignor to British Columbia Research Council, Vancouver, Canada

Filed Oct. 5, 1984, Ser. No. 658,036
Int. Cl.³ C08B *11/193*
U.S. Cl. 536—30 **29 Claims**

1. A process for preparing n-amino-n-deoxy cellulose where n is 2 or 3 and has the same value at each occurrence in one molecule, the process comprising:

(i) when n is 2 selectively oxidizing cellulose by (a) reacting it with triphenylmethyl chloride; then (b) reacting the product from (a) with acetic anhydride and dimethylsulfoxide, then (c) subjecting the product from (b) to reductive amination;

(ii) when n is 3 (a) reacting cellulose with dimethylsulfoxide and paraformaldehyde then (b) reacting the product from (a) with acetic anhydride and dimethylsulfoxide and then (c) subjecting the product from (b) to reductive amination.

16. A process for producing a branched water soluble cellulose derivative having at least part of the carbon atoms at position 2 or at position 3 substituted by an amino carbohydrate group, the process comprising subjecting 2-oxy-cellulose or 3-oxy-cellulose to reductive amination using an amino sugar and a reducing agent able to reduce the imine group in the presence of carbonyl.

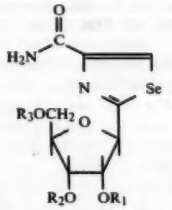
4,531,001

2-β-D-RIBOFURANOSYLSELENAZOLE-4-CARBOXAMIDE COMPOUNDS

Roland K. Robins, Provo, Utah, and Prem C. Srivastava, Oak Ridge, Tenn., assignors to Brigham Young University, Provo, Utah

Continuation-in-part of Ser. No. 360,968, Mar. 23, 1982, abandoned. This application Feb. 15, 1983, Ser. No. 465,221
Int. Cl.³ C07H *19/24*
U.S. Cl. 536—55 **25 Claims**

1. A compound of the structure I:



I

wherein R_1 and R_2 are each H or acyl and R_3 is H, acyl or

acyl being selected from the group consisting of C_{1-18} aliphatic acyl and aromatic acyl; and when R_3 is phosphono, physiologically acceptable salts thereof.

4,531,002
PROCESS FOR PREPARING INSECTICIDAL N-ACYL-TETRAHYDRO-2-NITROMETHYLENE-2H-1,3-THIAZINES

Martin Harris, Sittingbourne, England, assignor to Shell Oil Company, Houston, Tex.

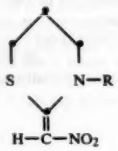
Filed Aug. 17, 1984, Ser. No. 641,618

Claims priority, application United Kingdom, Aug. 26, 1983, 8323057; Aug. 26, 1983, 8323059; Aug. 26, 1983, 8323060; Aug. 26, 1983, 8323061

Int. Cl.³ C07D *279/06*; A01N *43/86*

U.S. Cl. 544—54 **5 Claims**

3. A compound of the formula



wherein R is an optionally substituted acyl moiety selected from: benzoyl, dialkylcarbamoyl, phenoxycarbonyl, phenylthiocarbonyl, alkylthio-thiocarbonyl, phenylthio-thiocarbonyl, phenylsulfonyl, alkylaminosulfonyl, phenylaminosulfonyl, and acyl of the formula

wherein each R^o is optionally substituted alkyl or phenyl, and each X is oxygen or sulfur.

4,531,003
PURIFICATION OF CAFFEINE

Pierre Hirsbrunner, Corseaux, and Blaise Pavillard, Firbourg, both of Switzerland, assignors to Nestec S. A., Vevey, Switzerland

Continuation of Ser. No. 254,100, Apr. 14, 1981, abandoned. This application Mar. 23, 1983, Ser. No. 479,791

Int. Cl.³ C07D *473/12*

U.S. Cl. 544—275 **11 Claims**

1. A process for the purification of caffeine which comprises the following two steps, in any order:

(a) recrystallization of caffeine from an alkaline aqueous solution, with a pH of at least 6.5, containing a reducing agent selected from the group consisting of alkali metal sulfites, alkali metal dithionites or zinc powder and oxidation products thereof;

(b) extraction of the caffeine from a aqueous alkaline solution of caffeine with a substantially water-immiscible solvent which is liquid under the conditions of the process.

4,531,004
DIMETRONIDAZOLE PHOSPHATES

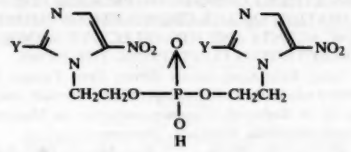
Richard R. Kurtz, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 323,860, Nov. 23, 1981, abandoned. This application Sep. 14, 1983, Ser. No. 526,576

Int. Cl.³ C07F *9/65*

U.S. Cl. 548—112 **2 Claims**

1. A compound having the formula



wherein Y is hydrogen or alkyl of from 1 to 3 carbons inclusive.

4,531,005
PYRAZOL-4-YL PHOSPHITES

Yoshiyuki Okada, Suita; Yoshihiro Inoue, Osaka, and Koichi Iwanaga, Ibaraki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

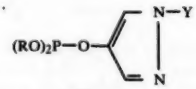
Continuation of Ser. No. 345,760, Feb. 4, 1982, abandoned. This application Feb. 23, 1984, Ser. No. 582,135

Claims priority, application Japan, Feb. 4, 1981, 56-16104

Int. Cl.³ C07F *9/63*

U.S. Cl. 548—116 **3 Claims**

1. A phosphorous acid ester derivative of the general formula



wherein R is ethyl; Y is a phenyl group which is substituted by one or more halogens, a trifluoromethyl, a lower alkyl group or a halogen and a lower alkyl group.

4,531,006
N-[(PHOSPHINYL) AMINO]THIO- AND N-[(PHOSPHINOTHIOYL)AMINO]-THIO-METHYLCARBAMATES

Stephen J. Nelson, Comstock Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 115,474, Jan. 25, 1980, Pat. No. 4,292,256, which is a continuation-in-part of Ser. No. 962,266, Nov. 20, 1978, Pat. No. 4,208,409, which is a continuation-in-part of Ser. No. 874,959, Feb. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 765,807, Feb. 4, 1977, Pat. No. 4,081,536. This application May 21, 1981, Ser. No. 265,735

The portion of the term of this patent subsequent to Jun. 17, 1997, has been disclaimed.

Int. Cl.³ C07D *339/06*; C07F *9/15*

U.S. Cl. 549—7 **5 Claims**

1. A compound selected from the group consisting of O-[[[[(5,5-dimethyl-2-thioxo-1,3,2-dioxaphosphorinan-2-yl) (1-methylethyl)amino]thio]methylamino]carbonyl]-1,3-dithiolan-2-one oxime, N-cyclohexyl-N-[[[[(1,3-dithiolan-2-ylideneamino)oxy]carbonyl]methylamino]thio]-5,5-dimethyl-1,3,2-dioxaphosphorinan-2-amine-2-sulfide, 3-(1,1-dimethylethyl)phenyl methyl[[(1-methylethyl)(2-thioxo-1,3,2-dioxaphosphorinan-2-yl)amino]thio]carbamate, and 2-chloro-3,4-dimethylphenyl methyl[[cyclohexyl(5,5-dimethyl-2-thioxo-1,3,2-dioxaphosphorinan-2-yl)amino]thio]carbamate.

4,531,007

CROWN ETHER COMPOUNDS, PROCESS FOR THE PREPARATION OF THE CROWN ETHER COMPLEX FORMING AGENTS AND ION-SELECTIVE MEMBRANE ELECTRODES CONTAINING THE SAME

László Toke; Béla Ágai; István Bitter; Erno Pungor; Klára Szepesváry née Tóth; Erno Lindner; Mária Horváth, and Jeno Havas, all of Budapest, Hungary, assignors to Magyar Tudományos Akadémia, Budapest, Hungary

PCT No. PCT/HU82/00034, § 371 Date Mar. 7, 1983, § 102(e) Date Mar. 7, 1983, PCT Pub. No. WO83/00149, PCT Pub. Date Jan. 20, 1983

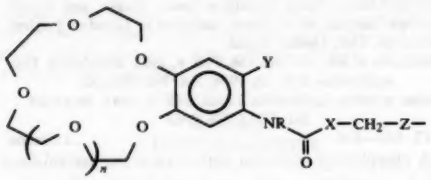
PCT Filed Jul. 9, 1982, Ser. No. 486,285

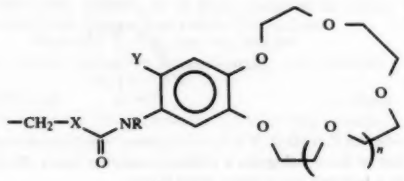
Claims priority, application Hungary, Jul. 9, 1981, 1999

Int. Cl.³ C07D *405/02, 407/02, 323/00*

U.S. Cl. 549—351 3 Claims

1. Crown compound of the formula





wherein

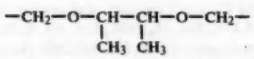
R stands for hydrogen or C_{1-4} alkyl,

n stands for 1, 2,

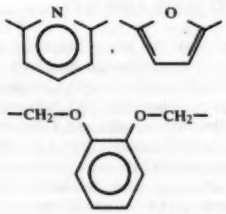
X stands for oxygen,

Y represents hydrogen or nitro,

Z represents a chemical bond, $-CH_2OCH_2-$, $-CH_2SCH_2-$,



or a group of the formula



4,531,008

OPTICALLY ACTIVE PHENYL ACETATES

Keimei Fujimoto, Hyogo; Nobuo Ohno, Osaka; Yoshitoshi Okuno, Osaka; Toshio Mizutani, Osaka; Isao Ohno, Osaka; Masachika Hirano, Osaka; Nobushige Itaya, Osaka, and Takashi Matsuo, Hyogo, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Japan

Continuation of Ser. No. 837,973, Sep. 29, 1977, abandoned, which is a continuation of Ser. No. 596,334, Jul. 16, 1975, Pat. No. 4,062,968, which is a division of Ser. No. 378,301, Jul. 11, 1973, Pat. No. 3,996,244. This application May 23, 1983, Ser. No. 497,289

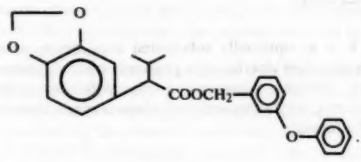
Claims priority, application Japan, Jul. 11, 1972, 47-69805; Apr. 19, 1973, 48-44809

The portion of the term of this patent subsequent to Dec. 13, 1994, has been disclaimed.

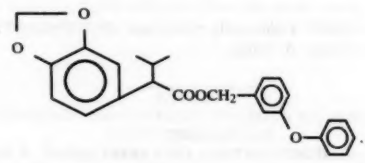
Int. Cl.³ C07D *317/44;* C07C *69/76, 121/75*

U.S. Cl. 549—447 30 Claims

7. An insecticidally or miticidally effective optically active phenyl acetate of the formula



8. An insecticidally or miticidally effective mixture of optical isomers of the formula



4,531,009

PROCESS FOR PREPARING α,ω-BIS(2-CHLOROPHENOXY)ALKANE-4,4'-DICARBOXYLIC ACID OR ITS LOWER ALKYL ESTER

Toshihide Inoue, Ichinomiya, and Hideo Komatsu, Ehime, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

PCT No. PCT/JP83/00024, § 371 Date Sep. 12, 1983, § 102(e) Date Sep. 12, 1983, PCT Pub. No. WO83/02609, PCT Pub. Date Aug. 4, 1983

PCT Filed Jan. 28, 1983, Ser. No. 537,393

Claims priority, application Japan, Jan. 29, 1982, 57-11863; Oct. 4, 1982, 57-173323

Int. Cl.³ C07C *69/76*

U.S. Cl. 560—65 8 Claims

1. A process for preparing an α,ω-bis(2-chlorophenoxy)alkane-4,4'-dicarboxylic acid or its lower alkyl ester which comprises reacting an α,ω-bis(phenoxy)alkane-4,4'-dicarboxylic acid or its lower alkyl ester with chlorine in the presence of a solvent selected from the group consisting (a) lower fatty acid having 2 to 6 carbon atoms, (b) hydrocarbon chloride having 1 to 8 carbon atoms, and (c) carbon chloride having 1 to 2 carbon atoms, in the absence or presence of a catalyst at a temperature below the boiling point of said solvent.

4,531,010
ESTER CURING AGENT FOR FLUOROCARBON POLYMER COATING COMPOSITION

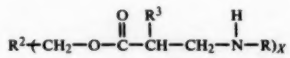
Joseph A. Vasta, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 509,705, Jun. 30, 1983,. This application Dec. 30, 1983, Ser. No. 566,996

Int. Cl.³ C07C *101/24, 101/26*

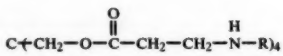
U.S. Cl. 560—125 **6 Claims**

1. A curing agent for fluorocarbon polymers consisting of

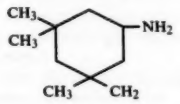


where R is R^1NH_2, R^1 is an aliphatic or cycloaliphatic hydrocarbon radical, R^2 is C or hydrocarbon group, R^3 is H or CH_3, where x is 3 when R^2 is a hydrocarbon group and x is 4 when R^2 is C.

6. A curing agent having the formula



where R is



4,531,011
ALKYL PERFLUORO-OMEGA-(2-IODOETHOXY) COMPOUNDS AND VINYL ETHERS THEREFROM

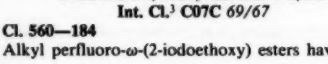
Carl G. Krespan, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 4, 1983, Ser. No. 472,101

Int. Cl.³ C07C *69/67*

U.S. Cl. 560—184 **6 Claims**

1. Alkyl perfluoro-ω-(2-iodoethoxy) esters having the formula



wherein

R_F is $—OCF_2CF(CF_3)(OCF(CF_3)CF_2—_m$ or $(OCF(CF_3)CF_2—_n$;

m is an integer of 2 to 7;

n is an integer and is 1, 3 or 4; and

R is H, $C_{1\ to\ 6}$ alkyl or M where M is an alkali metal.

4,531,012
ORGANIC TEMPLATE FOR SYNTHESIS OF ZSM-23 ZEOLITE

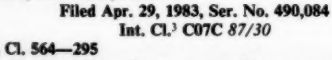
Ernest W. Valyocsik, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 29, 1983, Ser. No. 490,084

Int. Cl.³ C07C *87/30*

U.S. Cl. 564—295 **5 Claims**

1. A composition of matter comprising a compound of the formula:



wherein A is an organic or inorganic anion selected from the group consisting of phosphate, halogens, sulfate, bisulfate, bisulfite, carbonate, bicarbonate, hexafluorophosphate, nitrate, oxyhalogen, perchlorate, carboxylate, amide, alkoxide, and etherate and R_1 is an unsaturated straight chain hydrocarbon group.

4,531,013
PREPARATION OF A DIAMINOTETRANITRONAPHTHALENE

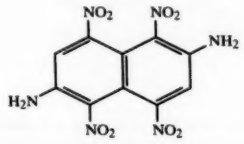
Albert A. De Fusco, and Arnold T. Nielsen, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 3, 1984, Ser. No. 637,634

Int. Cl.³ C07C *87/66*

U.S. Cl. 564—428 **16 Claims**

1. A compound 2,6-diamino-1,4,5,8-tetranitronaphthalene, with the structure:



2. A method for preparing 2,6-diamino-1,4,5,8-tetranitronaphthalene comprising the steps of:

A. converting a starting material of 2,6-dimethylnaphthalene into 2,6-naphthalene dicarboxylic acid;

B. nitrating said 2,6-naphthalene dicarboxylic acid with HNO_3 to form 1,5-dinitro-3,7-naphthalene dicarboxylic acid;

C. forming a suspension of said 1,5-dinitro-3,7-naphthalene dicarboxylic acid with H_2SO_4 and 1,2-dichloroethane and adding solid NaN_3 and NaOH to form 3,7-diamino-1,5-dinitronaphthalene;

D. reacting said 3,7-diamino-1,5-dinitronaphthalene with trifluoroacetic anhydride to form 1,5-dinitro-3,7-di(trifluoroacetamido) naphthalene;

E. nitrating said 1,5-dinitro-3,7-di(trifluoroacetamido) naphthalene with HNO_3 and H_2SO_4 to form 2,6-di(trifluoroacetamido)-1,4,5,8-tetranitronaphthalene; and

F. reacting said 2,6-di(trifluoroacetamido)-1,4,5,8-tetranitronaphthalene with methanol and dry hydrogen chloride to form 2,6-diamino-1,4,5,8-tetranitronaphthalene.

4,531,014
PROCESS FOR THE CONVERSION OF A C_2 TO C_{10} ALIPHATIC LINEAR OLEFIN TO A PRODUCT COMPRISING HYDROCARBONS OF HIGHER CARBON NUMBER

Reginald Gregory, Camberley, and David J. Westlake, Woking, both of England, assignors to The British Petroleum Company p.l.c., London, England

Filed Feb. 7, 1984, Ser. No. 577,842

Claims priority, application United Kingdom, Feb. 10, 1983, 8303740

Int. Cl.³ C07C *3/10*

U.S. Cl. 585—415 **19 Claims**

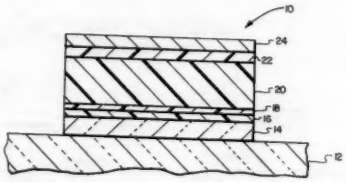
1. A process for the conversion of a C_2 to C_{10} aliphatic linear olefin to a product comprising at least one hydrocarbon of higher carbon number selected from dimers, oligomers, alkanes, olefins and aromatics which process comprises contacting the olefin at elevated temperature with a catalyst comprising a cation-exchangeable layered clay, selected from the group consisting of a naturally occurring smectite-type clay and a stabilised pillared smectite-type clay.

4,531,015

PIN AMORPHOUS SILICON SOLAR CELL WITH NITROGEN COMPENSATION

Boon Wong, Reseda; Don L. Morel, Agoura Hills, and Victor L. Grosvenor, Woodland Hills, all of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 12, 1984, Ser. No. 599,413
Int. Cl.³ H01L *31/06*
U.S. Cl. 136—258 **11 Claims**



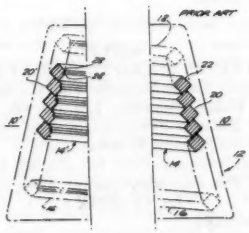
1. A solar cell comprising:
a transparent front face electrode,
a first layer of hydrogenated amorphous silicon contacting said front electrode, said first layer doped with an impurity of P conductivity type,
a second layer of hydrogenated amorphous silicon of essentially intrinsic conductivity, said second layer doped with nitrogen in a concentration of from two atomic percent to five atomic percent;
a third layer of essentially intrinsic hydrogenated amorphous silicon contacting said second layer;
a fourth layer of hydrogenated amorphous silicon contacting said third layer, said fourth layer doped with an impurity of N conductivity type; and
means for contacting said fourth layer.

4,531,016

MULTI-EDGE SPRING INSERT FOR TWIST-ON CONNECTORS

Wolfgang Duve, Hackettstown, N.J., assignor to Amerace Corporation, Hackettstown, N.J.

Filed Mar. 5, 1984, Ser. No. 586,266
Int. Cl.³ H01R *4/12*
U.S. Cl. 174—87 **10 Claims**



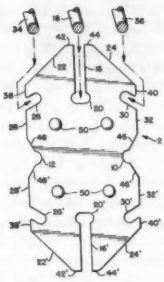
1. In a twist-on connector for engaging at least one electrical conductor, having an external insulating shell and a coiled wire spring insert comprising a plurality of turns of wire providing a hollow core therein for the receipt of at least one electrical conductor, the improvement comprising at least two continuous sharp edged ribs formed on each turn and extending along substantially the entire turn of said coiled wire spring insert, said ribs extending into said hollow core of said insert to engage and mechanically hold electrical conductors inserted therein.

4,531,017

INSULATOR FOR AN ELECTRIC HEATER

Jimmy L. Sherrill, Cookeville, Tenn., assignor to Tutco, Inc., Cookeville, Tenn.

Filed Nov. 25, 1983, Ser. No. 555,019
Int. Cl.³ H01B *17/56*; H05B *3/06*
U.S. Cl. 174—138 J **7 Claims**



1. An insulator for supporting a heater coil comprising a body of electrically insulating material having one end configured to engage individual convolutions of said heater coil, said one end having a slot extending in a first direction from an upper edge of said end downwardly into said body, said slot terminating in a first notch for receiving a convolution of said heater coil, a first guide surface sloping away from said slot in a second direction which forms an acute angle with said first direction, a second notch extending inwardly from a side of said body adjacent a lower terminus of said first guide surface for receiving a second convolution of said heater coil, the distance between an upper portion of said first guide surface and said slot being less than the distance between said first and second notches, a second guide surface sloping away from said slot in a third direction which forms an acute angle with said first direction, wherein said first and second guide surfaces are on opposite sides of said slot, and a third notch extending inwardly from a location adjacent the lower terminus of said second guide surface in a second side of said body for receiving a third convolution of said heater coil, the inner ends of said first, second, and third notches being substantially colinear and wherein the distance between an upper protion of said second guide surface and said slot is less than the distance between said first and third notches.

4,531,018

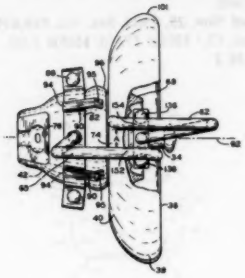
HIGH VOLTAGE ELECTRICAL INSULATOR WITH ARCING HORN

Heinrich P. Huster, 1607 Cinnamon Rd., Ft. Wayne, Ind. 46825

Filed Dec. 15, 1983, Ser. No. 561,646
Int. Cl.³ H01B *17/46*
U.S. Cl. 174—140 R **13 Claims**

1. In combination with a high voltage power transmission line insulator which includes a pair of terminals electrically isolated and mechanically coupled one to the other with an insulator body, an improved high voltage arcing horn device comprising a first elongated electrode fixedly secured at its proximal end to one of said insulator terminals, a second elongated electrode fixedly secured at its proximal end to the other of said terminals, said first and said second electrodes extending in predetermined, spaced relationship with respect to said insulator body and each including a distal end portion disposed

in predetermined parallel spaced relationship to the distal end portion of the other of said distal end portion to thereby define



an electrical arcing path therebetween of predetermined dimension.

4,531,019

INSULATING ARRANGEMENT FOR A CAPACITIVE PROTECTIVE FENCE HAVING A METAL ENCAPSULATED INSULATOR, A MOUNTING DEVICE FOR AN ELECTRIC WIRE AND A DEVICE FOR FASTENING THE INSULATING ARRANGEMENT TO A FENCE POST

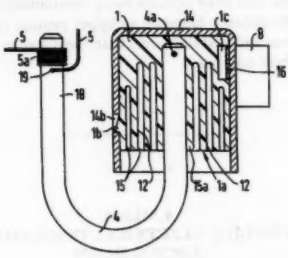
Herbert Foissner, Wolfratshausen; Herbert Krautwald, and Lutz Minke, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 21, 1983, Ser. No. 534,521

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1982, 3239163

Int. Cl.³ H01B *17/16, 17/50*

U.S. Cl. 174—163 F **4 Claims**



1. An insulating arrangement comprising, in combination:

(a) an insulator having at least one ring-shaped recess arranged on the bottom thereof forming a long path for leakage current,

(b) a mounting bracket extending axially downward from said bottom of said insulator, concentrically with said ring-shaped recess, said mounting bracket having fastening means on its free end for securing an electric wire; and

(c) a metal cup mounted over said insulator on which is arranged a mounting flange having two arms forming a U shaped configuration, said metal cup having a perforation adjacent each of said arms for receiving a clamping band for fastening the insulating arrangement to a post.

4,531,020

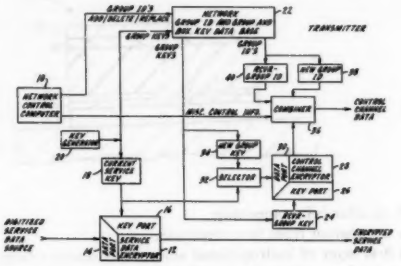
MULTI-LAYER ENCRYPTION SYSTEM FOR THE BROADCAST OF ENCRYPTED INFORMATION

Anthony J. Wechselberger, San Diego; Leo I. Bluestein, Rancho Bernardo; Leo Jedynak, San Diego; David A. Drake, Escondido, and Larry W. Simpson, Poway, all of Calif., assignors to Oak Industries Inc., Rancho Bernardo, Calif.

Filed Jul. 23, 1982, Ser. No. 401,258

Int. Cl.³ H04K *1/02*

U.S. Cl. 178—22.08 **5 Claims**



1. A method of controlling the simultaneous broadcast of enciphered digital information signals to a plurality of subscribers in which each subscriber has a permanent box enciphering key; in which the broadcast digital information signal is in a service enciphering key; and in which communication to subscribers may take place in a group enciphering key common to a group of subscribers having a common interest in the reception of broadcast signals of a particular type, including the steps of:

(a) simultaneously broadcasting digital information signals in a specific service key, which digital information signals are deciphered by subscribers having the service key,

(b) changing the service key at subscribers by simultaneously communicating the change in service key to subscribers in at least a portion of a group, such communication being in the group enciphering key,

(c) changing the group enciphering key in at least a portion of the subscribers in a group by communicating such change in the group enciphering key to the selected subscribers in the group, with each communication to a subscriber in the group being preceded by an address to designated subscribers in the group.

4,531,021

TWO LEVEL ENCRIPTING OF RF SIGNALS

Leo I. Bluestein, Rancho Bernardo; Paul E. Crandell, San Diego; David A. Drake, Escondido; Leo Jedynak, San Diego, and Larry W. Simpson, Poway, all of Calif., assignors to Oak Industries Inc., Rancho Bernardo, Calif.

Continuation-in-part of Ser. No. 160,985, Jun. 19, 1980, abandoned. This application Aug. 13, 1984, Ser. No. 640,212

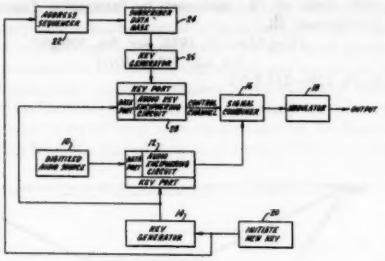
Int. Cl.³ H04K *1/02*

U.S. Cl. 178—22.08 **2 Claims**

1. In a subscription television system for broadcasting enciphered digital information bearing signals, means for using a first key to encipher the digital signals, means for simultaneously broadcasting the first key enciphered digital signals to multiple subscription television subscribers,

means for changing said first enciphering key applied to said digital signals, means for enciphering, in a second enciphering key, an information message as to the change in said first enciphering key, said second enciphering key being different for each of said multiple subscription television subscribers, with said information message including an address for each of said plurality of receivers, and

means for transmitting said enciphered information message, separately to each of said subscription television



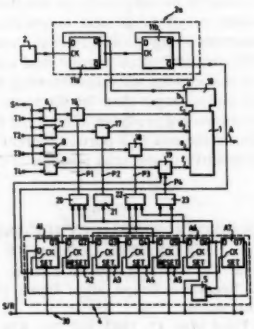
subscribers, each such enciphered information message being enciphered in a different second key.

4,531,022

DEVICE FOR GENERATING BINARY DIGIT PSEUDO-RANDOM SEQUENCES

Maurizio Pioli, Rome, Italy, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 13, 1983, Ser. No. 457,803
Int. Cl.³ H04K *3/00*
U.S. Cl. 178—22.19 **1 Claim**



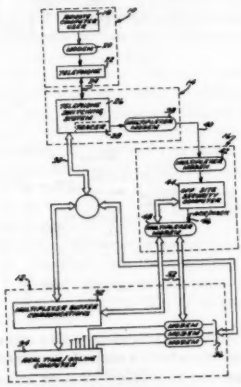
1. A device for generating pseudorandom sequences of binary digits, of the type comprising seven like logic sequential blocks synchronously driven by a predetermined frequency signal and each thereof assuming at the output the logic level of the related input depending on each pulse of said signal and assuming at said output a predetermined logic level as a predetermined logic level is present at an input thereof as supplied through a RESET line, the outputs of the first, second, third, fourth, fifth, sixth blocks being respectively coupled to the inputs of the second, third, fourth, fifth, sixth, seventh blocks and the outputs of said sixth and seventh blocks being coupled to corresponding inputs of an Exclusive-OR logic circuit the output thereof is coupled to the input of the first block; said device being associated with a logic apparatus coupling four discrete lines thereon a binary code information is transmitted having a frequency equal to the frequency of said signal with a line for transmitting binary code signals having a frequency which is four times said one frequency; said logic apparatus being of the type comprising: four two-input AND logic circuits, the first inputs thereof are correspondingly coupled to said four lines and the second inputs thereof are derived from a line effective to supply the synchronization signal; four Exclusive-OR logic circuits, provided with at least two inputs, and respectively a first, second, third and fourth Exclusive-OR circuits, the first inputs thereof being correspondingly coupled to the outputs of said AND circuits and the second inputs thereof being coupled to said device; a multiplexer provided with four inputs thereto there are correspondingly coupled the outputs of said first, second, third and fourth Exclusive-OR circuits and the output thereof is coupled to said transmission line; said device being characterized in that it comprises: a fifth Exclusive-OR logic circuit (**20**), provided with three inputs coupled to the outputs Q1,Q4,Q6 respectively of said first, fourth and sixth sequential blocks **A1**,**A4**,**A6** and the output thereof is coupled to the second input of said first Exclusive-OR circuit (**21**) the input thereof is coupled to the output **Q6** of said sixth sequential logic block **A6** and the output thereof is coupled to the second input of said second Exclusive-OR circuit (**17**); a seventh Exclusive-OR logic circuit (**22**) provided with three inputs respectively coupled to the outputs Q2,Q4,Q5 of said second, fourth and fifth sequential blocks **A2**,**A4**,**A5** and the output thereof is coupled to the second input of said third Exclusive-OR logic circuit (**18**); an eighth Exclusive-OR logic circuit (**23**) provided with two inputs coupled to the outputs Q2,Q5 respectively of said second and fifth sequential blocks **A2**,**A5** and the output thereof is coupled to the second input of said fourth Esclusive-OR circuit (**19**); said device being further characterized in that said RESET line (**30**) is coupled to a third input of said fourth Exclusive-OR circuit (**19**) and being furthermore coupled to the SET inputs of said first, third, fourth, sixth and seventh sequential blocks **A1**,**A3**,**A4**,**A6**,**A7** as well as to the RESET inputs of the remaining said sequential blocks **A2**,**A5**.

4,531,023

COMPUTER SECURITY SYSTEM FOR A TIME SHARED COMPUTER ACCESSED OVER TELEPHONE LINES

Paul J. Levine, Woodbridge, Va., assignor to HLF Corporation, Wilmington, Calif.

Filed Aug. 13, 1982, Ser. No. 408,024
Int. Cl.³ H04M *11/00*
U.S. Cl. 179—2 R **26 Claims**



1. A computer security system for preventing unauthorized access to a central computer, said central computer being remotely accessed through conventional telephone lines and through a conventional telephone switching system, said telephone switching system, characterized by automatic generation within said telephone switching system of unique identifying information corresponding to a remote caller accessing said central computer through said telephone switching system, said computer security system comprising:

an offsite security computer coupled to said telephone switching system for automatically receiving said identifying information relating to said remote caller, said offsite security computer includes a comparator for compar-

ing said unique identifying information obtained from said telephone switching system corresponding to said remote caller with corresponding file information identifying all authorized users of said central computer system; and

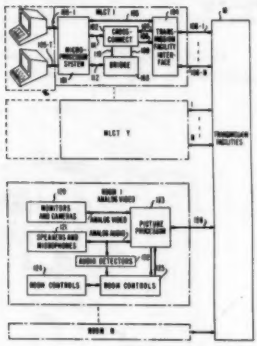
file means for storing said file information corresponding to authorized users of said central computer, said file means coupled to said offsite security computer and for providing said file information to said comparator within said offsite security computer for comparison with said unique identifying information generated by said telephone switching system, wherein said offsite security computer generates and transmits to said central computer an acknowledgment signal if said identifying information and file information are exactly identical, and generates and transmits to said central computer a negative acknowledgment signal when said identifying information and file information are not exactly identical, whereby said remote caller to said central computer cannot gain access to said central computer unless calling from a specified location which specified location is uniquely identified by user nonalterable information.

4,531,024

MULTILOCATION VIDEO CONFERENCE TERMINAL INCLUDING VIDEO SWITCHING CONTENTION CONTROL

John R. Colton, Freehold; Dominick Scordo, Middletown, and David M. Simmons, Howell, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 25, 1983, Ser. No. 545,206
Int. Cl.³ H04M *11/00, 3/56, 7/14*
U.S. Cl. 179—2 TS **15 Claims**



1. An apparatus for transmitting video signals to a plurality of remote locations, wherein each of the remote locations is or includes at least one conference location and each conference location generates a graphics transmission request message signal when a graphics video signal transmission is desired from the conference location,

means for resolving contention among the remote locations for the video signal to be transmitted from a conference location to other locations including

means for determining one conference location of said plurality of remote locations generating a graphics request message signal with an absence of graphics request message signals from all the other locations during a predetermined graphics timing interval; and

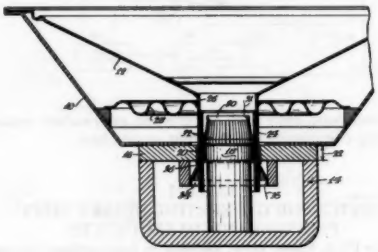
means for transmitting the video signal from said determined one conference location to all the other remote locations.

4,531,025

LOUDSPEAKER WITH COMMUTATED COIL DRIVE

Thomas J. Danley, Highland Park, and Charles A. Rey, Naperville, both of Ill., assignors to Intersonics Incorporated, Northbrook, Ill.

Filed Mar. 19, 1984, Ser. No. 590,897
Int. Cl.³ H04R *9/04*
U.S. Cl. 179—115.5 VC **7 Claims**



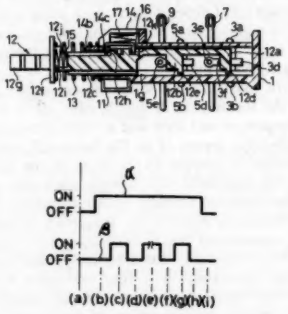
1. In a moving-coil loudspeaker wherein the loudspeaker comprises a magnet means having an annular flux gap with a given thickness, a cylindrical coil, means for supporting said coil for movement along the axis thereof, means for supplying said coil with electrical signal current, and a sound diaphragm connected to said coil for activation thereby, the improvement wherein said coil is longer than the thickness of said flux gap, and wherein means are provided to limit the flow of electrical signal current in the coil to a portion thereof disposed in said flux gap irrespective of the axial position of the coil.

4,531,026

MULTIPLE SWITCH ASSEMBLY HAVING PULSATING SECONDARY CONTACTS

Jiro Terajima, Furukawa; Tadahiko Suzuki, Yokohama, and Hisamichi Nagasawa, Tokyo, all of Japan, assignors to Sony Corporation, Japan

Filed Mar. 17, 1983, Ser. No. 476,228
Claims priority, application Japan, Mar. 19, 1982, 57-45172
Int. Cl.³ H01H *9/20, 13/56*
U.S. Cl. 200—5 R **9 Claims**



1. A switch comprising: a casing, an actuator adapted to slide within said casing by a given stroke; a spring for urging

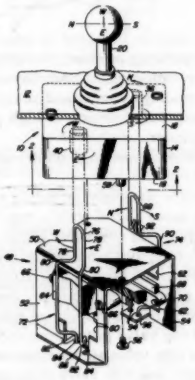
said actuator toward an initial position outwardly of said casing; means including a locking mechanism for preventing said actuator from returning toward the initial position by said spring at an intermediate position in said stroke; means including primary-side contacts adapted to be switched by said actuator in the course of movement thereof from said initial position to said intermediate position in said stroke; and means including secondary-side contacts adapted to be switched repetitively by said actuator in the course of movement thereof when said actuator is repetitively reciprocated against the force of said spring from the locked state at said intermediate position.

4,531,027

"JOY-STICK" AND ROCKER SWITCH CONTROL MECHANISM

James L. Vogt, and Michael J. Verhulst, both of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jun. 29, 1984, Ser. No. 626,369
Int. Cl.³ H01H *25/04*
U.S. Cl. 200—6 A **10 Claims**



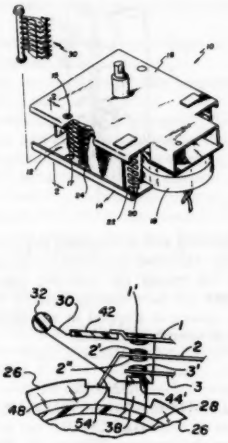
1. In a multi-directional control apparatus including a base having a top and a bottom, first and second separate driving members carried by the base for back and forth rocking respectively about first and second vertical axes and exposed at the bottom of the base and a joy-stick carried by and projecting above the top of the base and connected to the driving members for back and forth rocking of one member in response to back-and-forth movement of the joy-stick in a first path and for back and forth rocking of the other member in response to back and forth movement of the joy-stick in a second path normal to the first path, the improvement comprising a mounting element of inverted U-shape having a top affixed to the base bottom and further having first and second wall portions rigid with and depending from the top, first and second rocker switches carried respectively by the wall portions respectively directly below the first and second driving members for rocking to opposite sides of and return to neutral status, and first and second driven members connected respectively at their upper ends to the first and second driving members and depending in parallelism respectively to and respectively engaging the rocker switches for selective operation of said switches according to movement of the joy-stick.

4,531,028

TIMER WITH IMPROVED SWITCH BLADE ARRANGEMENT

Garry A. Stout, Bargersville, and Donald L. Ray, Oaklandon, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Dec. 27, 1983, Ser. No. 565,890
Int. Cl.³ H01H *43/10*
U.S. Cl. 200—38 R **5 Claims**



1. A timer including a housing and a camstack rotatable about an axis within said housing and having a hub portion and cams spaced about said hub portion;

switch means carried in said housing and located for actuation by said cams and including two individual blades the free ends of which are biased toward said camstack, one of said blades engaging said cams to actuate said one blade relative to the other of said blades;

a carriage including a rod carried by said housing near said free ends and individual followers extending from said rod and engaging said hub portion, said followers being individually flexible with respect to said rod as they are biased by said hub portion; the other of said blades riding on said carriage to reference said other blade to said hub portion, and

electrical contacts carried by said two blades selectively engaging one another.

5. A timer according to claim 1 further including a third blade having an electrical contact engaging an electrical contact of said one blade engaging said cam, the free end of said third blade riding on said carriage to reference said third blade to said hub portion.

4,531,029

CRICKET SWITCH

Currillies Trimble, 17912 Invermere Rd., Cleveland, Ohio 44128

Continuation of Ser. No. 338,076, Jan. 8, 1982, abandoned. This application Aug. 8, 1983, Ser. No. 521,061
Int. Cl.³ H01H *3/16*
U.S. Cl. 200—61.62 **11 Claims**

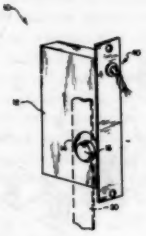
1. A non-magnetic friction-actuated automatically resetting switch, comprising:

a casing for attachment to a selected one of two relatively movable components including a closure such as a door, a window, or the like and a stationary frame structure within which the closure is movable;

a contact head always protruding outwardly of the casing and always in contact with the closure, the contact head

being movable relative to the casing in response to any opening movement of the closure, the contact head always being maintained in a rest position when the closure is not being moved;

a microswitch disposed within the casing, the microswitch being in contact with the contact head such that movement of the contact head from the rest position always results in switching of the microswitch; and



means for resetting and maintaining the contact head to the rest position whenever the closure is moved in an opening direction, the means for resetting operating after the contact head has been moved from its rest position, and when the closure is stopped in any position after being moved in an opening direction.

4,531,030

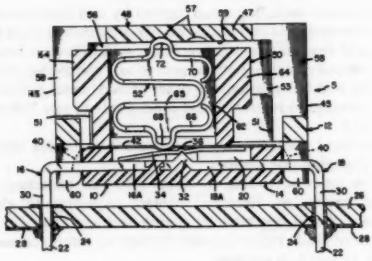
ELECTRICAL SWITCH AND ACTUATING MECHANISM THEREFOR

David J. Gingerich, Swatara; William H. Rose, Harrisburg; David W. Rupnik, Mechanicsburg, and David T. Shaffer, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 452,002, Dec. 21, 1982, abandoned. This application May 14, 1984, Ser. No. 610,179

Int. Cl.³ H01H *21/40*

U.S. Cl. 200—68.2 **25 Claims**



1. An electrical switch of the type comprising a dielectric frame having a series of electrical contact members secured in the frame, aligned contact sections of the contact members disposed in an upper surface of the frame and terminal sections of the contact members extending outwardly from the frame, movable electrical contact members pivotally mounted on one of the contact sections, a housing mounted on the frame, actuating members movably mounted in the housing from one position to another position and associated with respective movable contact members to move them from an actuated position electrically connecting the contact sections to a non-actuated position disconnecting the contact sections, characterized in that:

said actuating members comprise slide members, each of the slide members having an opening extending therethrough, a spring member disposed in said opening and including one section extending along a respective movable contact member to move the movable contact member to the actuated or non-actuated position and another section engaging an inside top surface of said housing and movable therealong to the one or the other position.

4,531,031

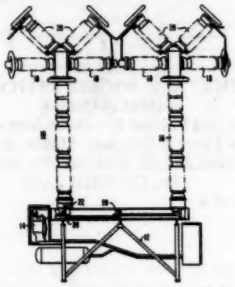
PNEUMATIC OPERATING MECHANISM FOR A CIRCUIT BREAKER

Willie B. Freeman, Irwin, and Richard M. Span, Penn Township, Westmoreland County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 321,136, Nov. 13, 1981, Pat. No. 4,463,229. This application May 11, 1984, Ser. No. 609,379

Int. Cl.³ H01H *33/42, 35/38*

U.S. Cl. 200—82 B **2 Claims**



1. Pneumatic operating mechanism, comprising:

a pneumatic operating mechanism having a driving piston within an operating cylinder and an opening valve assembly controlling the admission of high pressure air to said operating cylinder;

linkage means interconnecting said driving piston to a movable contact;

said opening valve assembly including a trip valve piston within a trip valve piston bore, a trip valve, a trip valve shaft connecting said trip valve piston to said trip valve, and means for rapidly eliminating pressurized air from said trip valve piston bore at a predetermined time;

said means for rapidly eliminating pressurized air from said trip valve piston bore including an exhaust port disposed between said trip valve piston bore and the outside atmosphere, and a trip valve stem extension disposed on said trip valve shaft. said trip valve stem extension being disposed within and having a sliding fit with said exhaust port, said trip valve stem extension and said exhaust port having predetermined diameters and said trip valve stem extension having a predetermined length to provide for control of the opening duration of said trip valve.

4,531,032

LOCKING TYPE PUSHBUTTON SWITCH

Taneo Murata, Iwaki, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Dec. 5, 1983, Ser. No. 558,325

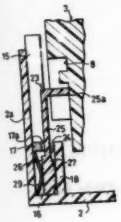
Claims priority, application Japan, Dec. 3, 1982, 57-182484[U]; Dec. 3, 1982, 57-182485[U]

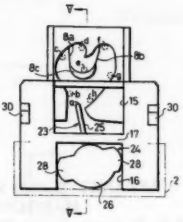
Int. Cl.³ H01H *13/56*

U.S. Cl. 200—153 J **4 Claims**

1. A locking type pushbutton switch having a stem movable axially within a case for activating a switch mechanism therein, and means including a heart-shaped cam groove formed on a side of said stem and a lock pin held resiliently into engagement with said cam groove for holding said stem in a locked position activating said switch mechanism, said lock pin being a unitary structure including a mounting part and a pin part, said mounting part having a spherical surface facing said stem and

adapted to engage a supporting wall held to a casing for said switch, and a spring urging said spherical surface against said supporting wall whereby said locking pin may move towards





or away from said stem to hold said pin part resiliently within said cam groove while being able to rotate in a plane parallel to the path for movement of said stem.

4,531,033

KEYBOARD FOR INITIATING SWITCHING OPERATIONS OR SWITCHING SIGNALS ASSOCIATED WITH RESPECTIVE SYMBOLS ON THE SURFACES OF THE KEYS

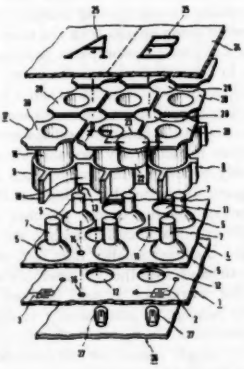
Theobald Schmid, Munich; Horst Widmaier, Grosshesselohe, and Friedrich Wolf, Planegg, all of Fed. Rep. of Germany, assignors to Hand Widmaier Fabrik Fur Apparate Der Fernmelde-und Feinwerktechnik, Munich, Fed. Rep. of Germany

Filed May 5, 1983, Ser. No. 491,894

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1983, 8302660[U]

Int. Cl.³ H01H 9/16

U.S. Cl. 200—314 **4 Claims**



1. A keyboard for initiating switching functions or switching signals, said keyboard having alpha-numeric symbols imprinted thereon and comprising:

an electrically insulative contact set carrier plate;

a plurality of conductive path regions arranged in a regular repetitive pattern on said carrier plate;

a guide matrix structure mounted above said carrier plate, said matrix having a plurality of guiding bores formed therein in a rectangle arrangement of rows and columns, said guide matrix structure being formed with apertures spaced from said guiding bores;

axially movable key means extending through and being guided within each of said guiding bores, said key means comprising:

an elastic switch actuating diaphragm in juxtaposition with said carrier plate;

a snap-action cup portion of said diaphragm normally spaced above said carrier plate;

a contact set actuating plunger integrally formed with said cup portion and extending upwardly therefrom; and

a cylindrical guide stem positioned to engage said plunger;

an electrically conductive bridging element mounted to at least some of said key means, said bridging element being normally spaced from and in juxtaposition with one of said conductive path regions, each said bridging element and conductive path regions comprising a contact set, said bridging element being mounted to the side of said cup portion opposite said plunger for selective actuation of said contact set;

a keyhead extending laterally from each said key means and forming a gap separating said adjacent keyheads, each said keyhead being formed with a recess at each corner thereby forming an aperture at each crossing of the gaps between keyheads in the rows and columns;

a synchronizing pin freely axially movably mounted in each said aperture, said axial movement being parallel to the direction in which said key means are movable, each said synchronizing pin being formed with a flange engaging that portion of said keyheads surrounding said aperture so that axial movement of said synchronizing pin causes movement of all said key means forming said aperture;

an elastic covering layer over the tops of said keyheads and synchronizing pins, said layer being imprinted with symbol-carrying inscription fields, said symbols being the alpha-numerical symbols of said keyboard, one of said symbols being associated with each said aperture and synchronizing pin, said synchronizing pins and at least portions of said covering layer being substantially transparent; and

a miniature signal lamp in said apertures, one said lamp being associated with each said symbol, said lamps being adapted to be connected so as to light upon depression of the respective symbol;

whereby when one of said symbols is depressed, all of the keys at that crossing are depressed and at least two of said contact sets are actuated to initiate a switching function associated with said depressed symbol.

4,531,034

KEY SWITCH DEVICES WITH INDICATOR LAMP MEANS

Hiroshi Inaba, Kawasaki, Japan, assignor to Nitsuko Limited, Kawasaki, Japan

Filed Mar. 21, 1984, Ser. No. 591,788

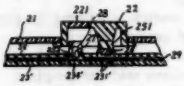
Claims priority, application Japan, Mar. 24, 1983, 58-41283[U]; May 2, 1983, 58-66757[U]

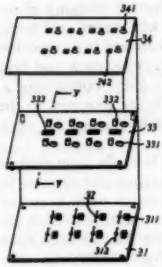
Int. Cl.³ H01H 9/16

U.S. Cl. 200—314 **4 Claims**

1. In a key switch device with an indicator lamp means which includes a housing plate, at least one key slidably fitted into an opening in said housing plate, supporting means for elastically supporting said key, an electric circuit board fixedly disposed inside said housing plate and having an upper surface with a pair of fixed contacts thereon, an indicator means

mounted on the circuit board in the vicinity of said fixed contacts, and a movable contact coupled to said key for coming into contact with said pair of fixed contacts when said key is pushed down, the improvement wherein said indicator means comprises a light emission diode tip, said light emission diode tip being mounted on said electric circuit board and electrically connected to the electric circuit on said electric circuit board, lamp cover means mounted on said electric circuit board for covering said light emission diode tip, said lamp cover means being formed of a light transparent material, said housing plate including a plurality of said keys and respectively for said keys, a plurality of sets of said supporting means, a plurality of said movable contacts, a plurality of said pairs of fixed contacts, a plurality of said light emission diode tips and a plurality of said lamp cover means, said plurality of light emission diode tips and said plurality of fixed contact pairs being commonly mounted on said circuit board, a light transparent plate overlying said circuit board, said transparent plate being provided with a plurality of hollow projections to form said plurality of lamp cover means, said transparent plate also being provided with a plurality of openings exposing said plurality of fixed contact pairs.



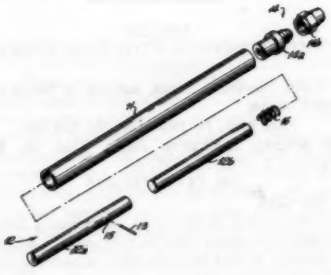


4,531,035

EXPOSED FERRITE CORE IMPEDER

Harald J. Dreckmann, Fairfield, Conn., assignor to Permag Corporation, Hicksville, N.Y.

Filed May 29, 1984, Ser. No. 614,768
Int. Cl.[3] H05B *6/02*
U.S. Cl. 219—8.5 **14 Claims**



1. An impeder, for use in an induction welding process for welding a seam on metal tubing, which comprises:

a sleeve;

a ferromagnetic core having a first end disposed in said sleeve and having a second exposed end which fully protrudes from said sleeve;

means for penetrating and connecting the first end of said ferromagnetic core to said sleeve; and

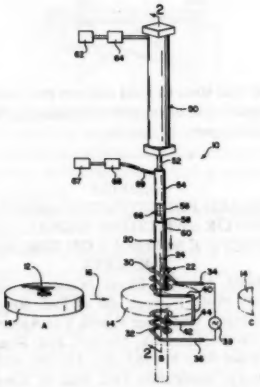
means for coupling coolant to said sleeve such that coolant flows between said sleeve and said ferromagnetic core.

4,531,036

APPARATUS AND METHOD FOR INDUCTIVELY HARDENING SMALL BORES

John C. Lewis, Dundas, Canada, assignor to Park-Ohio Industries, Inc., Shaker Heights, Ohio

Filed Apr. 20, 1984, Ser. No. 602,549
Int. Cl.[3] H05B *6/38*
U.S. Cl. 219—10.43 **9 Claims**



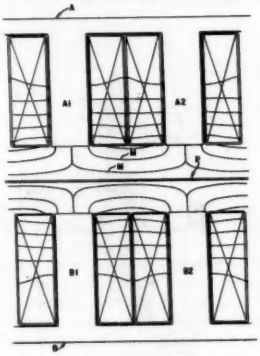
1. An apparatus for inductively heating a small internal passage in a workpiece, comprising: a cylindrical inductor coil assembly having multiple-turn inductor coil sections, said inductor coil sections having an inner diameter larger than said passage and spaced along an axis with the axial space therebetween defining a transverse workpiece passage for receiving the workpiece in coaxial alignment therewith at an indexed position, said inductor coil assembly adapted to be energized by electrical power supply means; actuator means mounted in fixed relationship with the inductor coil assembly and having an output member telescopically movable along said axis of said coil assembly between a heating position and a transfer position; a magnetically permeable cylindrical flux concentrator member carried by the output member and coaxially aligned with said axis of said coil assembly, said concentrator member having a diameter smaller than said passage and an axial length coextensive with the coil assembly in said heating position with the workpiece at said indexed position and spaced from the passage in said transfer position to permit insertion and removal of workpieces, whereby upon energization of the power supply means the coil assembly is magnetically coupled to the flux concentrator member and the latter inductively heats the surface of the passage in the workpiece to a predetermined heat treating temperature.

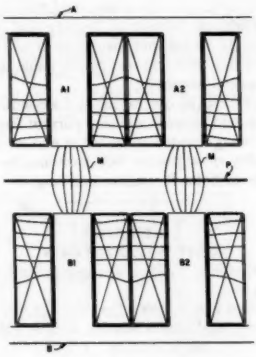
4,531,037

PROCESS AND MEANS TO CONTROL THE AVERAGE HEATING POWER INDUCED IN A FLAT CONDUCTING PRODUCT MAINTAINED ELECTROMAGNETICALLY IN POSITION WITHOUT CONTACT

Jean-Paul Camus, Mantes La Jolie, France, assignor to CEM Compagnie Electro-Mecanique, Paris, France

Filed Feb. 8, 1983, Ser. No. 464,948
Claims priority, application France, Mar. 12, 1982, 82 04181
Int. Cl.[3] H05B 5/00, 6/00
U.S. Cl. 219—10.75 5 Claims





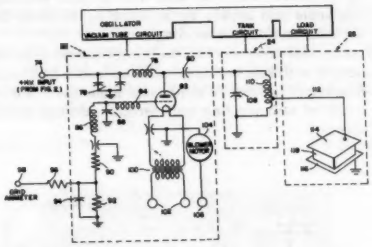
3. A control system for controlling an electromagnetic induction heating installation having a pair of inductors placed on either side of the product with the poles of one of the inductors facing the poles of the other inductor, the system comprising inverter means for selectively inverting the instantaneous polarity of the poles of one of the inductors with respect to that of the corresponding poles of the other inductor and means for controlling said inverter means as a function of at least one of a plurality of predetermined criteria related to product heating.

4,531,038

RADIO FREQUENCY DIELECTRIC HEATER

Harold R. Lillibridge, Burlingame, and John Sullivan, San Jose, both of Calif., assignors to Champion International Corporation, Stamford, Conn.

Filed Jun. 11, 1984, Ser. No. 619,296
Int. Cl.[3] H05B 6/50
U.S. Cl. 219—10.81 5 Claims



1. An improved RF dielectric heater having an adjustable power output and a stable output frequency comprising:

a power controller for providing a three-phase AC power output with variable phase angle control of such output;

a power transformer having input windings and output windings;

means for coupling the three-phase output of said power controller to the input windings of said power transformer;

rectifier circuit means for converting three-phase AC power input to a DC power output;

means for coupling the output windings of said power transformer to the input of said rectifier circuit means;

an RF oscillator circuit having an input and an output;

means for coupling the DC output of said rectifier circuit to said RF oscillator circuit input to power said oscillator circuit;

a tank circuit coupled to the output of said RF oscillator circuit;

load electrode means for creating a variable RF field in response to and in proportion to the output of said power controller to heat material passed through the field; and

circuit coupling means for coupling said load electrode means to said tank circuit, said circuit coupling means being connected directly to said load electrode means, such direct connection being characterized by the absence of any tuning components therein.

4,531,039

AUTOMATIC VALVE SEAT BUILD-UP WELDING APPARATUS

Masami Okano, Kita-kyushu; Akimasa Tanaka, Fukushima; Takeshi Suzuki, Kita-kyushu; Akira Ishida, Fukuoka, and Tatsuo Miyazaki, Kita-kyushu, all of Japan, assignors to Okano Valve Seizo Kabushiki Kaisha, Kita-kyushu, Japan

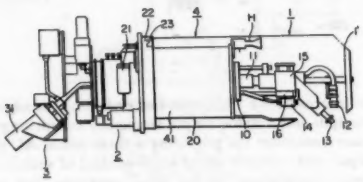
Filed Dec. 21, 1982, Ser. No. 451,963
Claims priority, application Japan, Dec. 26, 1981, 56-214896
Int. Cl.[3] B23K 9/225
U.S. Cl. 219—60 R 10 Claims

1. An automatic valve seat build-up welding apparatus for a Y-type main steam isolation globe valve used in an atomic power station which allows, at the time of the repair of said valve seat, the build-up welding operation with said valve remaining mounted to the piping in said plant, comprising substantially four mechanisms arranged on an axis including a welding unit mechanism, a main drive mechanism, an observation mechanism and a slip ring mechanism;

(i) said welding unit mechanism being adapted to be introduced into the valve box of said valve, and being provided with a rotatable main shaft extending in the longitudinal

direction thereof, said main shaft fixedly mounting at its forward end an image sensor and providing thereon a welding torch having centrally thereof an electrode and means for shielding said electrode by an inert gas such that said electrode is movable both in the direction of said axial line of said main shaft and in the direction orthogonal thereto under the condition that the axis of said electrode intersects said axial line of said main shaft at some angle, said welding torch having a build-up welding wire supply tip disposed such that said axis of said welding torch intersects said supply tip at some angle away from the forward end of said welding torch;

(ii) said main drive mechanism being adapted to be interconnected with said welding unit mechanism and including a number of motors to drive said main shaft and welding torch of said welding unit through motion transmitting means;



(iii) said observation mechanism being adapted to be connected to said main drive mechanism on the opposite side from said welding unit mechanism and having a television camera connected to said image sensor of said welding unit mechanism, said television camera transmitting image signals to a television receiver mounted on an outside control board through said slip ring mechanism, whereby said control board is operable to control various components of said apparatus;

(iv) said slip ring mechanism being adapted to be connected to said observation mechanism or said welding unit mechanism and provided with means to supply electrical current to said motors contained in said main drive mechanism as well as means as to deliver an inert gas to said welding torch of said welding unit mechanism, said slip ring mechanism further provided with cooling water delivery means to cool said welding torch and said image sensor of said welding unit mechanism.

4,531,040

HOT WIRE TYPE ARC WELDING TORCH AND CABLE

Akiyoshi Nawa; Yoshiaki Kato, and Takao Shimizu, all of Aichi, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Jan. 3, 1983, Ser. No. 455,078

Claims priority, application Japan, Jan. 11, 1982, 57-1929[U]; Jan. 11, 1982, 57-1931[U]

Int. Cl.³ B23K *9/16*

U.S. Cl. 219—74 **14 Claims**

1. A hot wire arc welding torch apparatus, comprising:

(a) a non-consumable electrode (2);

(b) a nozzle surrounding said electrode for supplying a shielding gas to an arc (6) and a weld puddle (10) formed on a workpiece (9);

(c) a TIG welding torch (1) mounting said electrode and nozzle;

(d) a vertical adjusting unit (28–32) disposed in parallel and in close proximity to said TIG welding torch and attached thereto by a holder (4);

(e) a slide member (27) rotatably attached to the lower end of a slide shaft (36) which is slidable in said vertical adjusting unit, said slide member being vertically movable with said slide shaft;

(f) a guide member (26) attached to the lower end of said slide member at an angle to said vertical adjusting unit for feeding a wire (5) of a filler metal to said arc formed between said electrode and said workpiece;

(g) a wire heating torch attached to the top of said vertical adjusting unit for supplying an electric current to said wire;

(h) a power source (20) for supplying an electrical current to a region between said wire and said workpiece through said wire heating torch to heat said wire; and

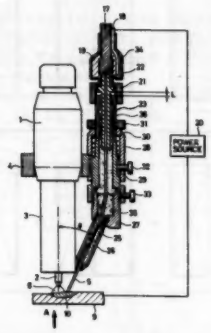
(i) a conduit cable (44) including an electrical power cable (45) connected to an upper end of said wire heating torch for feeding said wire;

(j) said wire being fed through said wire heating torch, said vertical adjusting unit and said guide member; and

said conduit cable comprising:

a liner (60) for guiding a welding wire (5);

a protective spring tube (50) surrounding said liner;



an adaptor (59) surrounding one end of said tube;

a current feeder (61) threadedly connected with said adaptor;

a current feeding ring (69) surrounding the other end of said tube;

a power cable (45) extending along said tube for supplying electrical current for heating said wire; and

a thermally shrinkable insulating tube (64) enclosing said spring tube and said power cable therein to form an integral assembly;

said power cable having at one end a conductor (63) held between said adaptor and said current feeder, said conductor being divided at the other end of said cable into a plurality of segments (65) individually secured in a plurality of holes formed in said ring.

4,531,041

SPOT WELDING GUN

Jan Larsson, Västerås, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Feb. 4, 1983, Ser. No. 464,000

Claims priority, application Sweden, Feb. 8, 1982, 8209705

Int. Cl.³ B23K *11/10*

U.S. Cl. 219—90 **10 Claims**

1. A scissor-type spot welding gun for use with a robot, said spot welding gun comprising

an attachment means capable of connection to the arm of a robot,

first and second electrode-holding arms,

mounting means supporting said first and second electrode-holding arms on said attachment means and permitting said first and second electrode-holding arms to pivot relative to one another between an open relative positioning and a closed relative positioning,

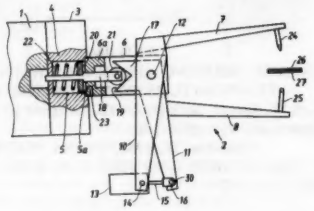
a first operating means connected between said first and second electrode-holding arms, said first operating means applying a bias on said first and second electrode-holding

arms to pivot them into their closed relative positioning, and

a second operating means cooperable with said first and second electrode-holding arms to cause them to pivot relative to one another into their open relative positioning, said second operating means including

a cam member on one of said first and second electrode-holding arms, said cam member being movable with its associated electrode-holding arm and providing an open concave cam surface,

an actuation means movably mounted in said attachment means so as to be movable toward and away from said



cam member, said actuation means including an abutment element for contacting the cam surface of said cam member, and

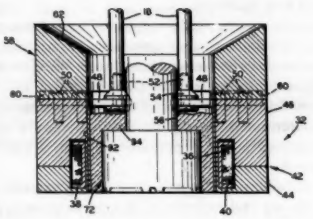
a pressure means for moving said actuation means towards said cam member such that the abutment element thereon will contact the cam surface of said cam member, said actuation means, under the influence of said pressure means, being capable of moving said cam member and its associated electrode-holding arm such that said first and second electrode-holding arms will pivot relative to one another against the bias of said first operating means and into their open relative positioning.

4,531,042

LARGE DIAMETER STUD AND METHOD AND APPARATUS FOR WELDING SAME

Thomas E. Shoup, Amherst; Dennis J. Maykut, Brook Park, both of Ohio, and Thomas W. Eagar, Cambridge, Mass., assignors to TRW Inc., Ohio

Filed Oct. 17, 1983, Ser. No. 542,423
Int. Cl.³ B23K *9/20, 9/08*
U.S. Cl. 219—99 **25 Claims**



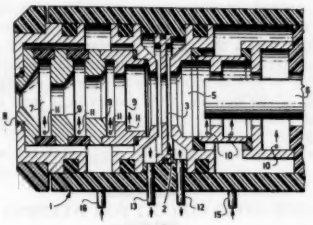
1. In a method of welding a stud to a workpiece, the stud having a welding tip at one end with flux in the tip, said method comprising positioning the stud substantially vertically to a workpiece with the tip in contact with the workpiece, positioning an arc blow coil around the stud, lifting the stud from the workpiece and imposing a voltage between the stud and the workpiece to establish a pilot arc therebetween, imposing a higher voltage between the stud and the workpiece to establish a main welding arc therebetween, and plunging the stud against the workpiece a period of time after the stud is lifted, the improvement comprising supplying low current to the arc blow coil substantially at the time the stud is lifted, and increasing the current to the arc blow coil gradually to a maximum in about one-fourth to one-half of the total weld cycle time after the stud is lifted.

4,531,043

METHOD OF AND APPARATUS FOR STABILIZATION OF LOW-TEMPERATURE PLASMA OF AN ARC BURNER

Karel Zverina; Denek Tluchor; Josef Szabo; Jaromir Polidor, and Petr Kroupa, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Feb. 15, 1983, Ser. No. 466,648
Claims priority, application Czechoslovakia, Feb. 15, 1982, 1023-82; Feb. 15, 1982, 1024-82
Int. Cl.³ B23K *9/00*
U.S. Cl. 219—121 PP **9 Claims**



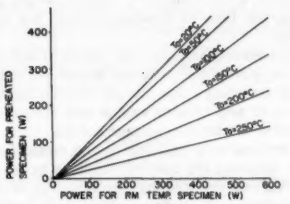
1. A method for the stabilization of a plasma of a low temperature arc burner having a discharge chamber and a stabilization channel, the plasma issuing from the discharge chamber toward an anode, comprising leading a first stabilization liquid into the discharge chamber of the arc burner, and leading a second stabilization liquid into the stabilization channel of the burner, the first stabilization liquid having at least one of the elements of the group consisting of carbon and nitrogen, and the second stabilization liquid having a chemical configuration and a boiling point which differ from those of the first stabilization liquid.

4,531,044

METHOD OF LASER SOLDERING

Dale U. Chang, West Bloomfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 24, 1983, Ser. No. 474,650
Int. Cl.³ B23K *15/00;* **H01C** *1/14, 1/144*
U.S. Cl. 219—121 LM **21 Claims**



EFFECT OF PREHEAT TEMPERATURE ON POWER REQUIREMENT

1. A method of soldering one or more electrical lead strands to a printed electrical path, comprising the steps of:

(a) planting said path on a ceramic substrate and attaching at least one solder pad to a portion of said printed electrical path;

(b) forcing a surface portion of said electrical lead strand

into full interengagement with said pad with an engaging force sufficient to permit heat conduction therebetween for soldering, said portion of said electrical lead strand and pad constituting a soldering assembly;

(c) directing a defocused laser beam onto said soldering assembly, and a beam-on time effective to exert a controlled thermal radius on said soldering assembly to reflow only a preselected portion of said pad and effect a solder joint between said pad and said strand portion, said joint having a strength of at least 400 grams;

(d) the parameters of beam power, beam spot diameter, and beam on time-are optimally correlated by the following equation:

$$c = \frac{a}{\sqrt{2}} \left(\ln \frac{2P.A.R(1 - \exp(-t_c/RC))}{\pi a^2 \cdot T_m} \right)^{\frac{1}{2}}$$

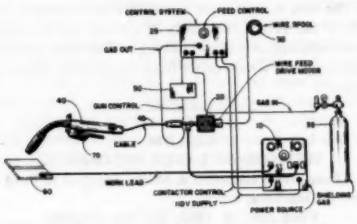
the critical thermal radius a is the Gaussian radius at $1/e^2$, ln is logarithm, Tm is the melting temperature of the solder minus the specimen temperature, P is the laser beam power it watts, A is the surface absorptivity of the solder at 10.6 microns, R is the thermal resistance per unit area of the system, tc is the ciritical time to bring the solder to the Tm temperature, c is the heat capacity of the system.

4,531,045

TRIGGER HOLD CIRCUIT FOR WELDING POWER SUPPLY

Gerrit V. Kemp, Troy, Ohio, assignor to Hobart Brothers Company, Troy, Ohio

Filed Jun. 27, 1984, Ser. No. 624,888
Int. Cl.³ B23K *9/10*
U.S. Cl. 219—132 **1 Claim**



1. A control circuit for an arc welder including a welding power source, a torch mounted control switch, and means for monitoring the flow of welding current, the control circuit comprising:

circuit means responsive to the closure of said control switch for energizing the welding power source, said circuit means including a first comparator having one input connected to said control switch and the other input connected to a reference voltage source;

means responsive to said monitoring means for providing a latch, allowing the control switch to be released without deenergizing the welding power source after sensing the establishment of welding current, said means including a second comparator having one input connected to said current monitoring means and the other input connected to said reference voltage source;

timer means responsive to said monitoring means for providing an output after a first predetermined time delay following the establishment of welding current;

further circuit means responsive to the output of said timer means and to the subsequent closure of the control switch for deenergizing the welding power source, said further circuit means including a comparator circuit having one input connected to said control switch and the other input connected to the output of said timer means whereby said comparator circuit will provide an output upon the closure of said control switch after said predetermined time delay, the output of said further circuit means being connected to modify the voltage level of said reference voltage source thereby to disable said first and second comparators upon the subsequent closure of said control switch; and

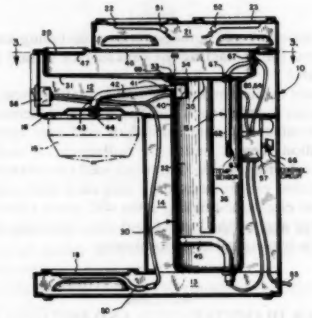
means responsive to said monitoring means for deenergizing the welding power source upon sensing the loss of welding current.

4,531,046

BEVERAGE BREWING APPARATUS WITH CONSTANT TEMPERATURE WATER RESERVOIR

Kenneth W. Stover, Springfield, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.

Filed Jan. 10, 1983, Ser. No. 456,735
Int. Cl.³ H05B *1/02*; F24H *1/20*; A47J *31/057*
U.S. Cl. 219—297 **4 Claims**



1. A beverage brewing apparatus comprising:

a hot water reservoir of predetermined volume;

means including a resistance heating element within said reservoir operable from an applied electric current for heating water in the reservoir;

inlet means for admitting a volume of cold water equal to a predetermined serving volume into an inlet zone at the bottom of said reservoir;

outlet means for discharging a volume of heated water equal to said predetermined serving volume from an outlet zone at the top of said reservoir coincident with the introduction of water by said inlet means into said reservoir;

said reservoir having a volume substantially greater than twice said predetermined serving volume whereby a volume of resident heated water is contained within a central brew zone thereof;

a segment of hollow heat-conductive tubing extending from a location at one end exterior to the reservoir to a predetermined location in said brew zone of said reservoir;

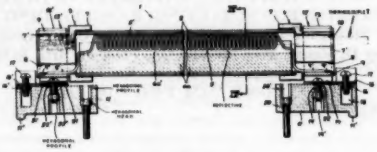
temperature sensing means disposed within the lumen of said tubing segment in thermal communication with said tubing segment at said predetermined location for producing a temperature control signal continuously indicative only of the temperature of the water at said predetermined location in said brew zone, and substantially non-indicative to the temperature of said water in said inlet and outlet zones; and

control circuit means responsive to said control signal for varying the duty cycle of the heating element over recurring timing intervals to maintain said water in said brew zone at a substantially constant predetermined temperature.

4,531,047
CLIP-MOUNTED QUARTZ TUBE ELECTRIC HEATER

Douglas M. Canfield, Suffern, N.Y., and Joseph Gialanella, North Caldwell, N.J., assignors to Casso-Solar Corporation, Pomona, N.Y.

Filed Jul. 28, 1982, Ser. No. 402,568
Int. Cl.³ H05B 3/44
U.S. Cl. 219—354 **4 Claims**



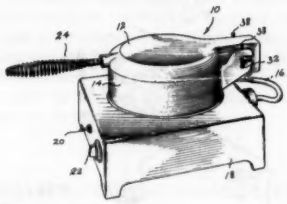
1. An electrical heater comprising:
an elongated cylindrical quartz tube;
a pair of terminals, one terminal being provided at each end of said elongated cylindrical quartz tube;
a heater coil having one end connected at each of said terminals and a helical portion within said elongated cylindrical quartz tube and extending the length thereof; and
a ceramic support provided in said elongated cylindrical quartz tube and extending the length of said helical portion, said ceramic support being formed with a heat-reflecting longitudinal groove having mutually inclined opposing sides which flank at least a portion of the circumference of the turns of said helical portion, each of said opposing sides engaging the turns of the helix tangentially in point contact, said ceramic support holding said helical portion with the turns thereof in tangential point contact with the inner surface of said elongated cylindrical quartz tube, whereby each turn of said helical portion is supported at three separate points, each of said terminals comprising:
a cylindrical ceramic cap fitted over an end of said elongated cylindrical quartz tube and formed with an opening through which an end of said heater coil can be extended,
a metal sleeve fitted over a portion of said cap and connected to said end of said heater coil, and
a metal spring clip mounted on a ceramic block and having opposing curved arms adapted to removably engage said metal sleeve and forming a mounting for said elongated cylindrical quartz tube, said portion of said cap extending axially and being cylindrical and of reduced diameter and said opening being a channel formed in the surface thereof and communicating with the interior of said elongated cylindrical quartz tube, and said sleeve being of slightly smaller diameter than said portion and being provided with a longitudinal split for allowing said sleeve to be force-fitted over said portion and overlying said channel, whereby said end of said heater coil is connected thereto, said cap being further provided with a second opening in axial alignment with the longitudinal axis of said heater coil for mounting a thermocouple therein extending within the turns of said helical portion.

4,531,048
CONFECTIONERY GRILL HAVING ADJUSTABLE HEATING ELEMENTS

Fred S. Carbon, Buchanan, Mich., assignor to F. S. Carbon Company, Buchanan, Mich.

Filed Jun. 4, 1984, Ser. No. 617,102
Int. Cl.³ H05B 3/06
U.S. Cl. 219—525 **2 Claims**

1. A confectionery grill having an upper heated grill unit and a base supporting a lower heated grill unit, hinge means pivotally connecting said upper and lower grill units together for allowing pivotal movement of the upper grill unit between a closed position overlying said lower grill unit and an open position displaced from the lower grill unit, said upper grill unit including grip means for shifting the upper grill unit between its open and closed positions, the improvement wherein said hinge means includes oppositely extending pins carried by said upper grill unit, said lower grill unit including opposed support parts each having a vertical slot therein defined by upper and lower support edges, said pins fitting into the slots of the support parts and being shiftable between said upper and

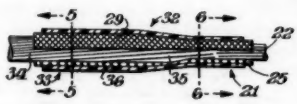


lower support edges of such slots upon movement of said upper grill unit toward and away from said lower grill unit when the upper grill unit is in its closed position, an adjustable protrusion part extending from each support part into said slot thereof at the upper support edge of the slot to restrict movement of the pin fitted into such slot toward its said upper support edge.

4,531,049
HEATING WIRE

Shunichi Sato, Sakodo, Japan, assignor to Junkosha Co., Ltd., Tokyo, Japan

Filed Nov. 13, 1984, Ser. No. 670,540
Claims priority, application Japan, Nov. 18, 1983, 58-218476
Int. Cl.³ H05B 3/54
U.S. Cl. 219—549 **7 Claims**



1. A heating electric wire comprising a heating portion, a connecting portion in which said heating portion is electrically and mechanically connected to a lead portion, the heating portion being a bundle of a plurality of elongate, electrically insulating tension members having a heating layer around the periphery of said bundle of tension members, the lead portion being a bundle of a plurality of elongate, electrical conducting wires, at least a portion of the insulating tension members being connected to at least a portion of the conducting wires in said connecting portion, the entire assembly having at heat resistant sheath around its periphery.

4,531,050
TAPE COUNTER

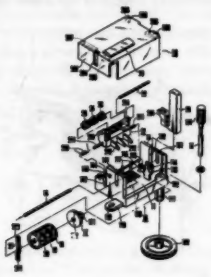
Satoshi Kaneko, Yonezawa, Japan, assignor to Tamura Electric Works, Ltd., Tokyo, Japan

Filed Oct. 21, 1981, Ser. No. 313,271
Claims priority, application Japan, Oct. 25, 1980, 55-152416[U]; Mar. 31, 1981, 56-46834[U]
Int. Cl.³ G06C 5/02, 15/42
U.S. Cl. 235—1 D **9 Claims**

1. A tape counter comprising a substantially U-shaped frame of synthetic resin including a bottom plate and a pair of upright side plates in parallel to each other at opposing ends of said bottom plate, each side plate being notched at the upper end

thereof by a digit wheel shaft engaging groove in a vertical direction on the same axial line,

digit wheels axially mounted in a freely rotatable fashion on a digit wheel supporting shaft which is supported between the frame side plates with both ends fitted in the engaging grooves, and



a cover assembled over the frame having an integrally formed lens member to magnify and display the digits on the digit wheels, said cover being provided with a pair of positioning projections integrally formed on the internal surface thereof, and said positioning projections being engaged with said engaging grooves so as to align the center line of the lens member with the reading line of the digit wheels.

4,531,051

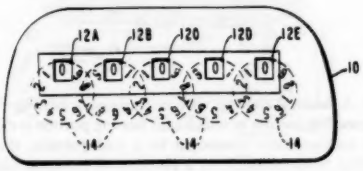
METER REGISTER WITH INCREMENTAL INDICIA WHEEL MOVEMENT

Joseph Sagmuller, Raleigh, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 30, 1984, Ser. No. 574,840

Int. Cl.³ G06C *27/00*

U.S. Cl. 235—1 C **7 Claims**



1. A register movement, comprising:

an indicator disc having a flat surface with a plurality of indicia thereon, said disc being connected to a first rotatable shaft at the center of said flat surface;

a transfer wheel being generally flat and having a scalloped edge, said transfer wheel being connected to said first rotatable shaft at the center of the transfer wheel, said scalloped edge having a plurality of cusps;

means for preventing said transfer wheel from rotating, said preventing means being shaped to fit between two adjacent ones of said cusps, said preventing means having a notch in its edge which is shaped to permit one of said cusps to extend therein, said preventing means being connected to a second rotatable shaft at the center of said preventing means, said first and second rotatable shafts being disposed parallel to each other; and

means for causing said transfer wheel to rotate about its center, said causing means comprising an extension which is shaped to engage a portion of said transfer wheel, said causing means being connected to said second rotatable shaft at the center of said causing means, said portion of said transfer wheel being a gap between two adjacent pegs of a plurality of pegs attached to said transfer wheel, each of said plurality of pegs extending perpendicularly from a flat plane of said transfer wheel in a direction parallel to said first rotatable shaft.

4,531,052

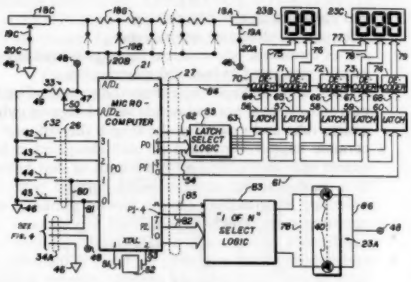
MICROCOMPUTER-CONTROLLED OPTICAL APPARATUS FOR SURVEYING, RANGEFINDING AND TRAJECTORY-COMPENSATING FUNCTIONS

Sidney D. Moore, 2045 Idylwild Dr., Prescott, Ariz. 86301

Filed Sep. 24, 1982, Ser. No. 422,823

Int. Cl.³ G06F *15/58;* **F41G** *3/06, 413/32*

U.S. Cl. 235—404 **10 Claims**



1. An optical apparatus for determining the distance between the apparatus and a target for hand held firearms having fixedly attached thereto a housing supporting ocular and objective lenses at opposite ends thereof and at least one image erecting lens arranged therebetween for forming an erect image of said target at the rear plane of focus of said image erecting lens, said rear plane of focus of said image erecting lens being adjustably coincident with the forward plane of focus of said ocular lens with the optical axes of said lenses being common and lying essentially parallel to the bore of said firearm comprising:

microcomputer means attached to said firearm including memory for receiving and storing permanent and temporary ballistic data, instructions pertinent to range-finding and other ballistic operations, means for computing range and compensation for aiming, and for generating a variety of signals relating to said computations performed relative to and by means of said data and instructions,

data input means communicating with said microcomputer means for receiving temporary data and instructions pertinent to rangefinding computations from an operator and storing them in said memory for affecting computations performed by said microcomputer means in a manner compensatory of changes in said data,

display means connected to said microcomputer means for selectively displaying indicia indicative of said signals generated by said microcomputer means superimposed upon the field of view of said apparatus viewable by the operator,

rangefinding signal generating means controlled by said microcomputer means and associated with said display means comprising a plurality of closely spaced electronic indicator elements adjacent a single stationary visible reference indicator,

said plurality of electronic indicator elements being controllably activatable by the operator so as to define a controllably variable space defined by said stationary reference indicator and an activated one of said plurality of electronic indicator elements,

the images of said activated electronic indicator element and

said single fixed reference indicator lying in a plane common with the forward adjustable plane of focus of said ocular lens of said apparatus so as to provide a focused image of the target superimposed upon focused images of said activated one of the plurality of electronic elements and said single fixed reference indicator all viewable simultaneously by the operator,

said variable space being indicative of a relationship between a size of an image of the target and the distance or range of the target from the apparatus and being interpreted by said microcomputer means as a measure of the distance to the target, and

said microcomputer means subsequently selectively activating one of said plurality of electronic indicator elements as a result of computations performed relative to said range interpretation and said stored data and instructions for generating a compensating aiming indicator viewable by the operator within the field of view of said apparatus along with the image of the target to facilitate improved accuracy in the aiming of said firearm.

4,531,053
RAILWAY WORK MACHINE

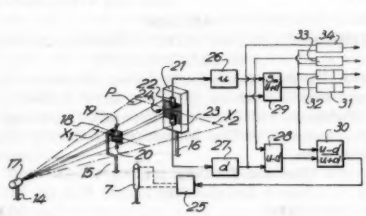
André Jaquet, Crissier, Switzerland, assignor to Sig Societe Industrielle Suisse, Schaffhausen, Switzerland

Continuation of Ser. No. 340,970, Jan. 20, 1982,. This application May 22, 1984, Ser. No. 613,017

Claims priority, application Switzerland, Sep. 25, 1981, 6198/81

Int. Cl.³ G01J 1/20

U.S. Cl. 250—201 2 Claims



1. A railway work machine comprising railway track displacement tools for correcting levelling and/or alignment defects of the railway track, at least one regulating member for adjusting the displacements of at least one of said tools, and a detection device for the detection of said defects, said detection device being connected to and controlling said regulating member and comprising, in combination, at least one series of three feelers arranged one behind the other at three spaced points of a line of rails of said railway track and to which there are connected, respectively in order, a point-source of light-rays emitter, a screen which masks off a part of said rays and has at least two parallel delimitting edges spaced apart from each other in the direction of the defect to be corrected, a receiver having at least one group of two photosensitive cell means for emitting electrical signals proportional to their irradiated surfaces and to the intensity of their irradiation, said two cell means having identical dimensions and electrical characteristics and being spaced apart from each other and aligned in a direction perpendicular to said two delimiting edges of the screen, whereby the two projected images of said two delimiting edges of the screen fall each in the middle of one of said two cell means when the axis of symmetry of the two delimitting edges is located in a reference plane defined by said point-source of light-rays and the axis of symmetry of said two cell means, and the difference of the irradiated surfaces of said cell means is proportional to the amplitude of the detected defects, and a processing circuit for the signals emitted by said two cell means comprising a first totalizer which delivers a signal proportional to the difference between the values represented by said signals, a second totalizer which delivers a signal proportional to the sum of the values represented by said signals, and a calculating unit connected to said two totalizers and outputting an end signal representative of the quotient of the values represented by the signals of said two totalizers, which end signal is used as a control signal for said regulating member, whereby the sum of the irradiated surfaces of said two cell means is a constant equal to the surface of one of them and therefore the signal delivered by the second totalizer is representative of the variations of the intensity of irradiation of said two cell means, and the value of the quotient represented by said end signal is exclusively proportional to the difference of the irradiated surfaces of said two cell means independently of the variations of intensity of their irradiation and therefore said end signal may be also used as an indication of the actual amplitude of the detected defects.

4,531,054
WAVEFRONT LIGHT BEAM SPLITTER

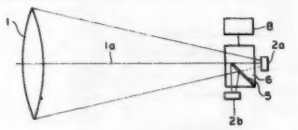
Takeomi Suzuki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 30, 1982, Ser. No. 403,472

Claims priority, application Japan, Jul. 31, 1981, 56-119325

Int. Cl.³ G01J 1/20

U.S. Cl. 250—201 9 Claims



1. A light beam splitter for splitting a light beam from a focusing lens to obtain two split light beams each incident on one of the pair of light receiving elements comprising:

a total reflection film, said film being positioned to one side of a plane containing the optical axis of the focusing lens so that the light beam from the focusing lens is split in two by said total reflection film, said film being further disposed such that the split light beam transmitted through a region free from said total reflection film is received by one of the light receiving elements while the split light beam reflected in a region where said total reflection film is situated is directed towards the other light receiving element.

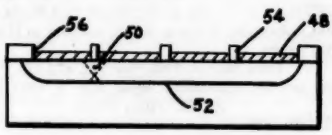
4,531,055
SELF-GUARDING SCHOTTKY BARRIER INFRARED DETECTOR ARRAY

Freeman D. Shepherd, Jr., Chelmsford; Paul W. Pellegrini, Bedford; Charlotte E. Ludington, Sherborn, and Melanie M. Weeks, Fitchburg, all of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 5, 1983, Ser. No. 455,677

Int. Cl.³ H01J 40/14

U.S. Cl. 250—211 J 7 Claims



1. A Schottky infrared internal photoemission focal plane

array having architecture for maximizing the photosensitive area of said array comprising:

a first semiconductor substrate; and

a plurality of metallic photoemission elements disposed on a surface of said substrate forming a two dimensional matrix of Schottky barrier photodiodes on said substrate;

said Schottky diodes being spaced at a distance within which their individual depletion regions overlap and merge to create a continuous depletion field below the surface of said substrate, thereby suppressing the high fields which occur when depletion region edges are permitted to meet said surface of said substrate, and resulting in the suppression of dark currents and breakdown effects in said array.

4,531,056

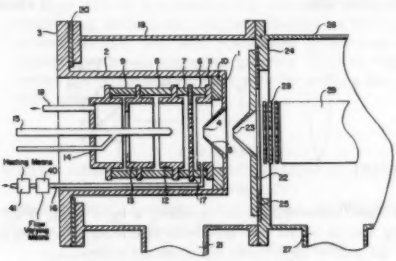
METHOD AND APPARATUS FOR THE MASS SPECTROMETRIC ANALYSIS OF SOLUTIONS

Michael J. Labowsky, Wayne, N.J.; John B. Fenn, Branford, Conn., and Masamichi Yamashita, Tokyo, Japan, assignors to Yale University, New Haven, Conn.

Filed Apr. 20, 1983, Ser. No. 486,645

Int. Cl.³ B01D *59/44*

U.S. Cl. 250—288 **37 Claims**



1. In a method of generating ions for mass spectral analysis from a sample dissolved in a solution by electrospray ionization the improvement comprising:

(a) causing said solution to flow through a capillary tube or jet;

(b) maintaining a high electrical potential difference between said capillary tube or jet and a first conductive wall spaced from and disposed facing the outlet of said capillary tube or jet thereby causing said solution to be electrosprayed from said outlet;

(c) maintaining the ambient pressure between said outlet and said wall at substantially atmospheric pressure;

(d) providing between said wall and said outlet a flow of inert gas substantially counter to the flow from said outlet;

(e) providing an orifice in said wall in alignment with the axis of said capillary tube or jet at the outlet thereof; and

(f) maintaining the pressure on the side of said wall remote from said outlet at a reduced pressure whereby gas containing ions from said solution characteristic of said sample flows through said orifice.

4,531,057

APPARATUS AND METHOD FOR ADJUSTING OPTICAL AXIS OF ELECTRON MICROSCOPE

Hiroyuki Kobayashi, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 4, 1983, Ser. No. 472,233

Claims priority, application Japan, Mar. 5, 1982, 57-33917

Int. Cl.³ H01J *37/26*

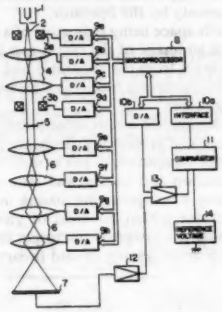
U.S. Cl. 250—311 **12 Claims**

1. An optical axis adjusting apparatus for the electron microscope, comprising:

a radiation lens system for adjusting the convergence of the electron beam radiated on a specimen;

electron beam deflectors for adjusting the optical axis of said electron beam;

an image-forming lens system for forming an enlarged image of the specimen by focussing the electron beam from said specimen;



a phosphor plate for displaying the enlarged image and detecting the electron beam quantity applied thereto; and

adjusting means for setting the optical axis by controlling said electron beam deflectors in a manner to maximize the electron beam quantity detected on said phosphor plate.

4,531,058

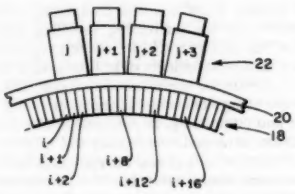
POSITRON SOURCE POSITION SENSING DETECTOR AND ELECTRONICS

Charles A. Burnham, South Essex; John F. Bradshaw, Jr., Winthrop; David E. Kaufman, Brockton; David A. Chesler, Newton Highlands, and Gordon L. Brownell, Cambridge, all of Mass., assignors to The Massachusetts General Hospital, Boston, Mass.

Filed Jan. 28, 1982, Ser. No. 343,558

Int. Cl.³ G01T *1/20*

U.S. Cl. 250—363 S **23 Claims**



1. A system for sensing the position of a scintillation event comprising:

scintillation means responsive to radiation received over a field of view to produce a light-emitting interaction therewith;

said scintillation means being characterized as a plurality of stacked scintillation elements;

a plurality of photodetectors placed to receive light from said plural stacked elements;

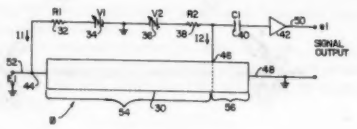
said photodetectors being less numerous than said scintillation elements and being positioned adjacent each other in a single line such that each of said plural photodetectors will respond to light from a plurality of said stacked elements; and

means responsive to said plural photodetectors for localizing the light source to one among said plural stacked elements.

4,531,059
NON-DELINEATED SEMICONDUCTOR DETECTOR ARRAY FOR INFRA-RED

John B. McCullough, Marlboro, and Craig A. Mortensen, Chelmsford, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 9, 1984, Ser. No. 569,012
Int. Cl.³ G01T 1/22
U.S. Cl. 250—370 11 Claims



1. In a thermal radiation imaging system comprising detector means and scanning means for scanning a thermal radiation image across said detector means, a radiaton detector comprising:

A. an elongated strip of semiconductor material which is photoconductive by the generation of electron and hole photocarriers when said radiation image is scanned along said strip;

B. means for applying lengthwise through said strip a bias electric current producing an ambipolar drift of photocarriers in said strip whose velocity and direction of drift substantially match respectively the velocity and direction of scanning of said strip;

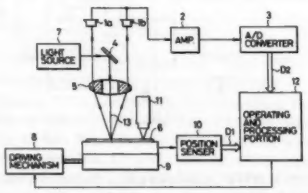
C. first and second readout electrodes connected to said strip near one end of said strip, said strip having an active length and said readout electrodes having a separation such that minority photocarriers in said drift reach said separation between said readout electrodes in a time less than the average electron hole recombination time of said semiconductor material; and wherein the improvement comprises

D. means for applying a second bias electric current such that the drift of said photocarriers in said strip between said readout electrodes is at a rate greater than the drift of said photocarriers through said active length of said strip.

4,531,060
POSITIONING METHOD

Kyoichi Suwa, Kawasaki; Kazuo Kuramochi, and Kiwao Nakazawa, both of Tokyo, all of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Sep. 23, 1982, Ser. No. 422,007
Claims priority, application Japan, Sep. 28, 1981, 56-153207
Int. Cl.³ G01H 21/86
U.S. Cl. 250—548 16 Claims



1. A method for positioning an object, on which predetermined patterns are formed and which is mounted on a stage, comprising the steps of:

(a) converting said patterns into electrical signals corresponding to their positions on said object;

(b) extracting from the electrical signals first information composed of electrical signals as distributed in correspondence to the patterns contained in a first region on said object which is mounted on said stage in advance;

(c) extracting from the electrical signals second information composed of electrical signals distributed in correspondence to the patterns contained in a second region inclusive of said first region on said object which is newly mounted on said stage;

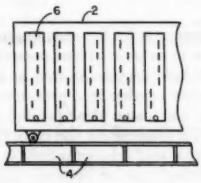
(d) comparing said first and second information, and searching for an electrical signal in said second information having a distribution characteristic that is most similar to that of an electrical signal in said first information; and

(e) detecting a position of the newly mounted object as a result of said comparing and searching.

4,531,061
ELECTRICALLY SETTABLE ESCORT MEMORY

Jacob Rabinow, Bethesda, Md. 20817

Filed Jul. 1, 1982, Ser. No. 394,206
Int. Cl.³ G06K 7/10
U.S. Cl. 250—566 14 Claims



1. In a sorting device,

a series of article carrying devices for respectively receiving articles to be sorted,

a multiplicity of destinations, each of which is represented by a coded signal,

means for moving said devices past said destinations,

each article carrying device having means associated therewith for releasing any article stored in the device at a selected destination, comprising:

(a) a plurality of spaced surfaces, each of which surfaces is carried by and in a fixed and immovable relationship with respect to its complementary article carrying device,

(b) control means associated with each said surface, and having an electrical input, which in response to a signal on its input changes a characteristic of its complementary surface,

(c) stationary code imparting means for controlling the input signals to each and every control means associated with a given article carrying device to determine the characteristic of the surfaces associated with said given device, so that the characteristics of said surfaces constitute a coded signaling device,

(d) said stationary code imparting means and said control means comprising means for changing said characteristics,

(e) said stationary code imparting means and said control means being in spaced relation to each other and the stationary code imparting means communicating to said control means through the space between them and without physical contact, and

(f) stationary signal responsive means, associated with each destination, responsive to the codes on the coded signaling devices of the article storage devices for releasing at a given destination any article in any article carrying device whose coded signaling device presents a coded signal representing that given destination.

4,531,062

DOCUMENT SCANNING APPARATUS

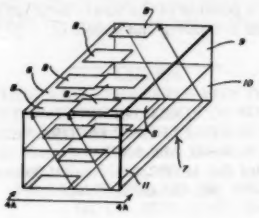
Detlef Engemann, Oberursel; Dieter Fischer, Frankfurt, and Heinz Kleeberg, Nuremberg, all of Fed. Rep. of Germany, assignors to Triumph-Adler Aktiengesellschaft fur Buro- und Informationstechnik, Nuremberg, Fed. Rep. of Germany

Filed Nov. 16, 1982, Ser. No. 442,017

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1981, 3145952

Int. Cl.³ H01J *40/14*

U.S. Cl. 250—578 **3 Claims**



1. Lensless apparatus for line scanning an original document moving relative to an object plane comprising

a line array of light sensors located in an image plane and spaced from one another by a predetermined distance,

a light panel in said image plane parallel to said line array of light sensors for illuminating said object plane whereby light is reflected from said document onto said light sensors,

a light transmitting medium between said object and image planes having a thickness which is twice the distance from the lead edge of one light sensor to that of another light sensor, and

diaphragms defined by opaque areas located in said light transmitting medium in a plane midway between and parallel to said object and image planes, said opaque areas being equal in dimension to and opposite areas between said light sensors for limiting exposure of said light sensors substantially to reflected light normal to said light sensors.

4,531,063

SYSTEM FOR RECOVERING WAVE ENERGY AND ITS CONVERSION INTO USEFUL ENERGY

Paolo Vielmo, Via Podestarile 17, Padova; Attilio Brighenti, Cannareggio 1040, Venice, and Antonio Biandino Alamia, Via Ronzinella 77, Mogliano Veneto (Treviso), all of Italy

Filed Aug. 2, 1982, Ser. No. 404,387

Claims priority, application Italy, Aug. 18, 1981, 23544 A/81

Int. Cl.³ F03B *13/12, 13/10;* **F15B** *11/06*

U.S. Cl. 290—53 **32 Claims**

1. A system for recovering wave energy and its conversion into useful energy, comprising:

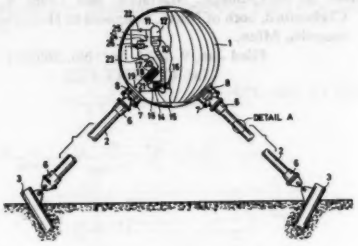
(a) a pickup member kept in a submerged position;

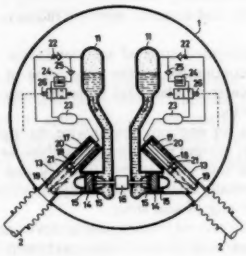
(b) at least one resilient line connected mechanically at one end to said pickup member and at the other end to means fixed to the sea bed, the interior of said resilient line being in communication at one end with an accumulation member and being closed at the other end, and being also filled with an incompressible liquid;

(c) an accumulation member constituted by a vessel filled with gas under pressure;

(d) means for converting the pressure and kinetic energy of the incompressible liquid into mechanical energy;

(e) means for interrupting the communication between the resilient lines and the accumulation member; and





(f) means for generating electrical energy utilizing the mechanical energy.

4,531,064

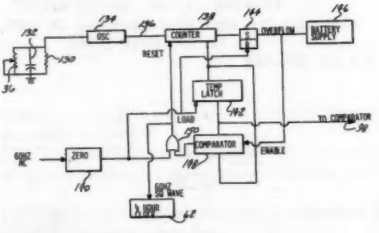
ELECTRONIC THERMOSTAT WITH REPETITIVE OPERATION CYCLE

Michael R. Levine, 2900 Heatherway, Ann Arbor, Mich. 48104

Division of Ser. No. 350,522, Feb. 19, 1982, Pat. No. 4,469,274, which is a division of Ser. No. 153,343, May 27, 1980, Pat. No. 4,335,847. This application Feb. 13, 1984, Ser. No. 579,409

Int. Cl.³ H02J *9/00;* **G05D** *23/24*

U.S. Cl. 307—66 **1 Claim**



1. An apparatus that generates clock pulses in a microprocessor-controlled electronic thermostat, normally powered from an A.C. line voltage, even during line voltage outages, the apparatus comprising:

a backup battery supply;

a variable frequency oscillator;

means driving the oscillator at a frequency proportional to the ambient temperature;

a resettable counter counting the oscillations of the oscillator

and capable of generating an overflow signal when the count increases past the limits of the counter;

a bi-state switch means supplying battery power to the thermostat when the switch means is in its first state and removing battery power from the thermostat when the switch means is in its second state, the switch means being placed in its first state in response to an overflow of the counter;

means detecting zero crossings of the A.C. line voltage and, upon detection of a zero crossing, causing the storage of the count presently in the counter, resetting the counter, placing the switch means in its second state, and generating a clock pulse; and

a comparator, operative when the switch means is in its first state, comparing the stored count with the count presently in the counter and, when the two are equal, generating a clock pulse.

4,531,065

CURRENT INJECTION TYPE LOGICAL OPERATION CIRCUIT ARRANGEMENT INCLUDING A I^2L CIRCUIT DEVICE COMPRISING I^2L ELEMENTS

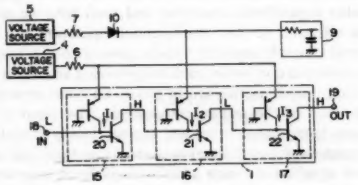
Koichi Nakayama, Saitama, and Yoshito Tanaka, Kawagoe, both of Japan, assignors to Toko, Inc., Tokyo, Japan

Filed Jul. 28, 1982, Ser. No. 402,566

Claims priority, application Japan, Jul. 29, 1981, 56-118685; Aug. 3, 1981, 56-121724; Jun. 18, 1982, 57-92194[U]

Int. Cl.³ H03K *19/003, 19/091*

U.S. Cl. 307—200 A **6 Claims**



1. A I^2L circuit device for setting a predetermined logical value, which includes means for generating a control signal, said device comprising:

a first and a second current source circuit for injecting injector current into said I^2L circuit device; and

an auxiliary current source circuit connected to said second current source circuit for injecting injector current into a I^2L element of said I^2L circuit device, wherein when main power supply is interrupted after the predetermined logical value has been set, injector current is injected from said auxiliary current source into said I^2L element to thereby hold the logical condition, so that when the main power supply is restored, the logical value having been set prior to the interruption of the main power supply is restored.

4,531,066

VARIABLE BIAS LOGIC CIRCUIT

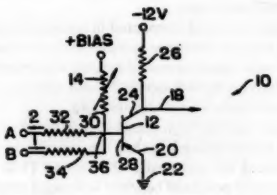
Robert W. Kearns, 9725 Lookout Pl., Gaithersburg, Md. 20760

Continuation of Ser. No. 498,895, Aug. 20, 1974, which is a continuation of Ser. No. 418,967, Nov. 26, 1973, which is a continuation of Ser. No. 229,954, Feb. 28, 1972, which is a continuation of Ser. No. 56,131, Jul. 6, 1970, which is a continuation of Ser. No. 612,526, Jan. 30, 1967. This application Nov. 15, 1978, Ser. No. 961,051

Int. Cl.³ H03K *19/20, 19/123*

U.S. Cl. 307—445 **13 Claims**

1. A logic circuit comprising a switching device which will switch between first and second binary conditions in accordance with the level of an applied current, a plurality of inputs each adapted to receive a signal representing a different binary variable, a weighting means for each of said binary variables to provide a current level in accordance with the value of the corresponding binary variable providing one current level to represent one value and another current level to represent the other binary value, each of said weighting means providing a different current level magnitude to represent said one value than either of the current levels provided by each other



weighting means and biasing means for providing a bias current level, said weighting means and said biasing means comprising summing means to add the current levels provided thereby together and apply the sum of said current levels to said switching device whereby the logic function of the logic circuit depends upon the current level provided by said biasing means.

4,531,067

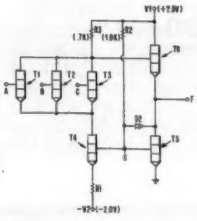
PUSH-PULL DARLINGTON CURRENT SINK (PPDCS) LOGIC CIRCUIT

Dennis C. Banker, Newburgh; Frank A. Montegari, Wappingers Falls, and John P. Norsworthy, Fishkill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1983, Ser. No. 508,967

Int. Cl.³ H03K *19/013, 19/082, 19/20*

U.S. Cl. 307—454 **3 Claims**



1. A low voltage high speed logical NOR circuit having a highly reliable push-pull output and improved noise tolerance, said circuit comprising:

first, second and third transistors, each of said first, second and third transistors having an emitter, base and collector, said collector of said third transistor connected to a first source of potential V1, and said emitter of said second transistor connected to a third source of potential V3;

input circuit means, said input circuit means receiving n binary inputs, where n is a positive integer having a magnitude of two or greater, said input circuit means connected to said collector of said first transistor and said base of said third transistor, said input circuit means comprising n transistors, each of said n transistors having an emitter, base and collector, said collector of each of said n transistors being directly connected to said base of said third transistor, said emitter of each of said n transistors being directly connected to said collector of said first transistor, and said base of each of said n transistors receiving a discrete one of said n binary inputs;

a first resistor R1 connected between said emitter of said first transistor and a second source of potential V2;

a second resistor R2 connected between said first source of potential V1 and a common connection of said base of said first transistor and said base of said second transistor;

a third resistor R3 connected between said base of said third transistor and said first source of potential;

a diode connected across said base-collector junction of said second transistor;

an output terminal connected in common to said collector of said second transistor and said emitter of said third transistor, said output terminal electrically manifesting the logical binary NOR function of said n binary inputs received by said input circuit means; and

said low voltage high speed logical NOR circuit being further characterized in that the magnitude of the potential provided by said first (V1), second (V2) and third (V3) sources of potential bear the following relationship, one to another, V1>V3>V2, and the magnitude of the resistance of said first (R1), second (R2) and third (R3) resistors bear the ratio (R1/R2/R3) one/one/seven-tenths (1/1/0.7), one to another.

4,531,068

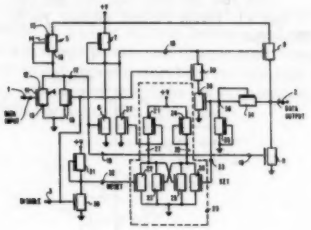
BUS LINE PRECHARGING TRISTATE DRIVER CIRCUIT

Wayne R. Kraft, Coral Springs; Victor S. Moore, Gainesville; William L. Stahl, Jr., Coral Springs, and Nandor G. Thoma, Boca Raton, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 19, 1983, Ser. No. 533,393

Int. Cl.³ H03K *19/094, 19/003*

U.S. Cl. 307—473 **6 Claims**



1. A signal line precharging tristate driver circuit formed on an integrated circuit chip for driving a signal line located off of the chip comprising:

a first input terminal for receiving two-level binary input signals;

driver circuitry coupled to the first input terminal and having a normal uninhibited operating mode for producing on the signal line two-level binary output signals having values determined by the values of the input signals;

a second and separate input terminal for receiving a control signal;

Precharge circuitry coupled to the second input terminal and to the driver circuitry and responsive to a control signal at the second input terminal for overriding the binary input signals and causing the driver circuitry to commence charging the signal line; and

tristate circuitry coupled to the second input terminal and to the driver circuitry and operative during the occurrence of the control signal for responding to the output voltage level of the driver circuitry for switching the driver circuitry to a high impedance output condition when its output voltage reaches a predetermined level.

4,531,069

LOGARITHMIC AMPLIFIERS

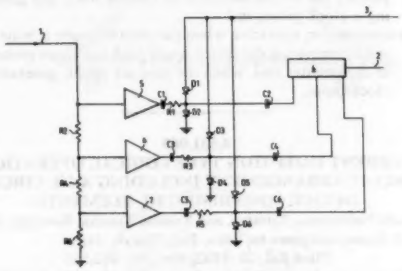
John A. Parker, Lowton, England, assignor to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 355,209, Mar. 5, 1982, abandoned. This application Nov. 2, 1984, Ser. No. 667,387

Claims priority, application United Kingdom, Mar. 6, 1981, 8107054

Int. Cl.³ G06G *7/24*

U.S. Cl. 307—492 **4 Claims**



1. A logarithmic amplifier for receiving an AC input signal and providing an AC output signal, comprising:

a number of similar stages arranged in cascade, which stages each include amplifier means and means forming an associated logarithmic converter and each have an accurate cut off point in their amplification operation, the output signal of each amplifier means passing to the associated logarithmic converter, each stage having an output signal, which output signals are in phase, an input arrangement for each of the stages, respectively, the input arrangements being constructed and arranged so as to maintain a consistent phase of signal to each of the stages and so as to feed a different range of incoming signal magnitude to each stage, and a unit for combining said output signals, whereby a composite AC output signal can be provided which is a function of the logarithm of the input signal.

4,531,070

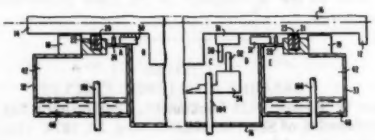
TURBINE GENERATOR HYDROGEN FILTRATION SYSTEM

Earl C. Kuhn, Penn Hills Twp., Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 16, 1982, Ser. No. 442,071

Int. Cl.³ H02K *9/26*

U.S. Cl. 310—56 **7 Claims**



1. A gas cooled dynamoelectric machine with gas decontamination comprising:

a rotor supported for rotation on a pair of axially spaced bearings, said bearings each being supplied with a lubricant;

a generator frame between said pair of bearings enclosing a volume containing gas cooled parts of the machine with seal means proximate interfaces of said frame and said rotor for limiting escape of gas from said frame;

said seal means having a gap in relation to said rotor through which said bearing lubricant flows in an axial direction;

at least one defoaming tank located to receive lubricant and gas from the axial inward side of each of said seal means to form in said at least one defoaming tank a quantity of liquid lubricant above which exists a mist of gas and lubricant vapor;

said generator frame volume having a normal cooling gas pressure at first regions proximate said seal means greater than the pressure of said mist in said at least one defoaming tank, said generator frame volume also having a second region with a cooling gas pressure less than that at said first regions and also less than that of said mist in said at least one defoaming tank;

means, within said generator frame, for establishing the pressure difference between said generator frame volume first regions and said second region;

first conduit means in fluid communication with said mist in each of said at least one defoaming tank for carrying said mist to a filtration system effective to remove lubricant vapor therefrom; and,

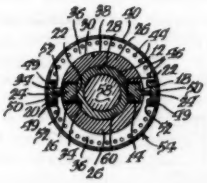
second conduit means in fluid communication with said second region of said generator frame volume for carrying clean cooling gas from said filtration system.

4,531,071

ROTOR ASSEMBLY

Lawrence J. Kintz, Jr., and Joseph F. Rossie, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 12, 1983, Ser. No. 560,852
Int. Cl.³ H02K *21/12, 15/02*
U.S. Cl. 310—156 **11 Claims**



1. A rotor assembly for a rotary electric machine comprising:

a shaft adapted to be journalled in a rotary electric machine;

at least one pair of locating means on said shaft, each said locating means being equally angularly spaced from the adjacent locating means;

non-magnetic spacers, one for each locating means, disposed about said shaft in predetermined relation with and in abutment with said locating means;

a plurality of generally arcuate permanent magnet segments disposed about said shaft between said spacers;

a plurality of magnetic pole pieces, one for each magnet, disposed radially outwardly of a corresponding magnet and disposed between said spacers; and

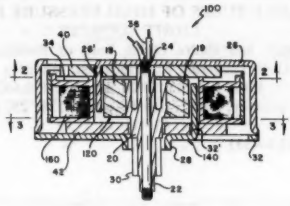
non-magnetic retaining means overlying said spacers and interconnecting the adjacent ends of adjacent pole pieces to hold the components of said rotor in assembled relation.

4,531,072

SHADED POLE SYNCHRONOUS MOTOR

Robert F. Weaver, Indianapolis, and Ted G. Proctor, Plainfield, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Apr. 1, 1983, Ser. No. 481,574
Int. Cl.³ H02K *21/00*
U.S. Cl. 310—162 **7 Claims**



1. A shaded pole synchronous motor comprising

an apertured field coil,

a permanent magnet rotor positioned in said aperture of said field coil, a plurality of poles about the periphery of said permanent magnet, alternate ones of said poles being of one polarity and the remaining poles being of an opposite polarity, and

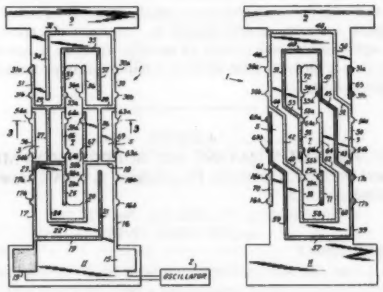
a first stator member including first shaded and unshaded stator poles projecting into said aperture adjacent said poles of the rotor, said first shaded and unshaded stator poles being of three different widths, a second stator member including second shaded and unshaded stator poles projecting into said aperture adjacent said poles of the rotor and intermeshed with said first stator poles, the second shaded and unshaded stator poles being of two different widths.

4,531,073

PIEZOELECTRIC CRYSTAL RESONATOR WITH REDUCED IMPEDANCE AND SENSITIVITY TO CHANGE IN HUMIDITY

Errol P. EerNisse, Sandy, Utah, assignor to Ohaus Scale Corporation, Florham Park, N.J.

Filed May 31, 1983, Ser. No. 499,772
Int. Cl.³ H01L *41/08*; G01L *1/10*
U.S. Cl. 310—370 **24 Claims**



1. A piezoelectric crystal resonator operating in air comprising:

a piezoelectric crystal having top, bottom, and side surfaces, said crystal having a mechanical resonant frequency in air;

an excitation means for exciting said crystal to vibrate in air at its mechanical resonant frequency;

an electrode means deposited on said top, bottom, and side surfaces connecting said excitation means and said crystal for rendering said mechanical resonant frequency insensitive to humidity changes; and

means for applying a force to said crystal to change its mechanical resonant frequency in air.

4,531,074

ELECTRICAL CURRENT INLET PARTICULARLY FOR DISCHARGE TUBES OF HIGH PRESSURE DISCHARGE LIGHT SOURCES

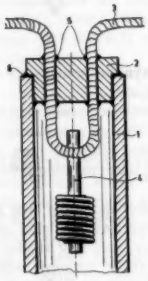
János Nagy, and Endre Oldal, both of Budapest, Hungary, assignors to Tungsram Rt., Budapest, Hungary

Filed Feb. 22, 1983, Ser. No. 470,683

Claims priority, application Hungary, Feb. 25, 1982, 570/82

Int. Cl.³ H01J *5/50*

U.S. Cl. 313—331 **10 Claims**



1. Electrical feed-through, preferably for high pressure gas discharge light sources, said feed-through is preferably passed through a ceramic material made from aluminum oxide, said feed-through being hermetically bound to said ceramic material with a binding material, preferably vitreous enamel having an appropriately selected heat expansion coefficient, characterized in that the electrical feed-through comprises a bundle of metal threads, wherein said threads are molybdenum or molybdenum alloy or tungsten or tungsten alloy.

10. Light source with high pressure gas discharge, which in the outer envelope has placed a discharge tube preferably of ceramic tube made from aluminum oxide and tube enclosure preferably made from aluminum oxide ceramics, comprising at least two electrodes with joined electrical feed throughs, said electrical feed-throughs are hermetically sealed to the tube end closure with a binding material, preferably vitreous enamel, the heat expansion coefficient of said enamel is adjusted to the ceramic material, characterized in that each electrical feed-through comprises a bundle of metallic threads, wherein said threads are molybdenum or molybdenum alloy or tungsten or tungsten alloy.

4,531,075

ELECTRON GUN HAVING ARC SUPPRESSION MEANS

Robert P. Stone, Lancaster, Pa., assignor to RCA Corporation, Princeton, N.J.

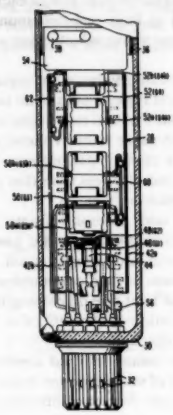
Filed Sep. 27, 1982, Ser. No. 424,140

Int. Cl.³ H01J *29/96*

U.S. Cl. 315—3 **9 Claims**

1. In an electron gun comprising at least one cathode for generating an electron beam along a beam path and a plurality of electrodes serially disposed along the beam path, said electrodes including at least one low voltage electrode and at least one high voltage electrode, wherein the improvement comprises

a plurality of resistors interconnecting selected ones of said electrodes, at least one electrode of said plurality of electrodes being a split member comprising two spaced apart sections interconnected by one of said plurality of resistors, said interconnected sections normally being operable at substantially the same voltage, whereby said resistors



act as a voltage divider in the event of an arc to limit the arc current and prevent damaging cascading arcs.

4,531,076

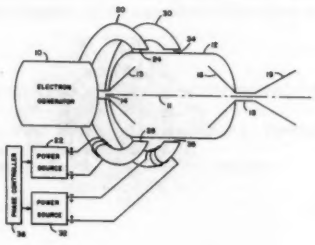
ELECTRON BEAM STIMULATED ELECTROMAGNETIC RADIATION GENERATOR

James D. Holder, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 2, 1982, Ser. No. 446,091

Int. Cl.³ H01J *25/00*

U.S. Cl. 315—4 **5 Claims**

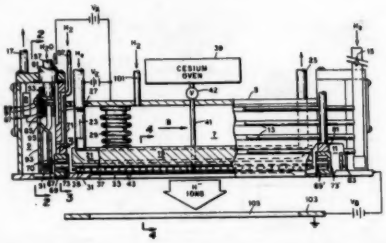


1. An electromagnetic radiation generator comprising: an evacuated chamber; an electron source for directing a beam of electrons axially into said chamber; deflection means positioned adjacent said chamber for time varying deflection of said electron beam by varying said deflection of the beam as it passes through respective first and second parallel planes normal to axial flow through said chamber and thereby generating electromagnetic radiation within said chamber; means for coupling said electromagnetic radiation from the chamber; and said deflection means is a pair of wiggler magnets each having first and second poles disposed in parallel planes across said chamber and said magnets having an adjustable frequency power source for controllably varying respective rates of magnetic field alternation across said chamber in adjustable phase relationship within said first and second planes normal to the beam axis.

4,531,077
ION SOURCE WITH IMPROVED PRIMARY ARC COLLIMATION

William K. Dagenhart, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 16, 1983, Ser. No. 562,147
Int. Cl.³ H01J 7/24
U.S. Cl. 315—111.81 4 Claims



1. In an ion source for generating negative ions from a selected molecular species wherein said selected species is introduced in a gaseous state into a converter chamber of a housing including a converter plate disposed within said converter chamber, said converter plate having an ion converter surface oriented in spaced relation to a negative ion exit opening in said converter chamber in a focusing arrangement with said ion converter surface, said converter being operated at a negative potential relative to said housing so that positive ions of said species generated in a plasma column extending over said converter surface within said chamber are accelerated onto said converter surface to convert said positive ions to negative ions of said species by means of surface ionization and extractor means for forcing said negative ions generated at said converter surface back through said plasma column and out said exit opening in said converter chamber, an electron arc discharge collimating system comprising:

a filament disposed in a filament chamber of said housing;

an anode structure forming a portion of a wall of said housing between said filament chamber and said converter chamber, said anode having an opening aligned with the longitudinal axis of said plasma column;

a collimator plate insulatably disposed between said filament and said anode, said collimating plate having an aperture therethrough aligned with said opening in said anode structure for collimating electrons emitted from said filament and accelerated through said aperture in said plate by said anode;

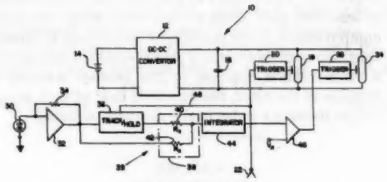
means for biasing said filament at a negative potential relative to said anode;

a resistor connected between said collimating plate and said anode, so that said collimator plate is initially biased at the anode potential, said resistor being of a value such that said collimator plate is self-biased at essentially the filament voltage during operation of said ion source so that said aperture in said collimator plate defines the primary electron stream for an arc discharge forming said plasma column by the collision of said electrons streaming through said collimating plate aperture and said anode from said filament with said molecular species along the length of said plasma column.

4,531,078
CONTROL CIRCUIT FOR ELECTRONIC FLASH

Joseph M. Canter, Lexington, and William A. Shelton, Cambridge, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 27, 1983, Ser. No. 545,872
Int. Cl.³ H05B 41/32
U.S. Cl. 315—151 9 Claims

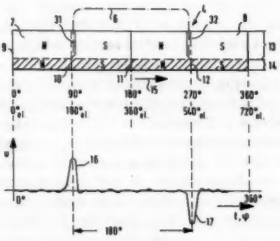


1. In an electronic flash device of the type having means responsive to the detection of scene light for controlling the duration of the flash of artificial illumination, the improvement comprising means for providing an output flash termination control signal responsive to the integration of an artifical scene light detection signal indicative of only the artificial scene light intensity of the flash regardless of the ambient scene light intensity immediately prior to the flash being fired wherein said artificial scene light detection signal is the sum of a first signal corresponding to the ambient and artificial scene light intensity detected during the flash of artificial illumination and a second signal corresponding to the inverted value of the ambient scene light intensity detected immediately prior to the flash of artificial illumination.

4,531,079
BRUSHLESS DC DRIVE MOTOR FOR SIGNAL RECORDING MEANS

Rolf Müller, St. Georgen, Fed. Rep. of Germany, assignor to Papst-Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany

Filed May 26, 1983, Ser. No. 498,451
Claims priority, application Switzerland, May 27, 1982, 3263/82
Int. Cl.³ H02K 29/02
U.S. Cl. 318—254 15 Claims



1. Brushless DC motor comprising:

a stator having winding means forming at least four stator poles creating an electromagnetic field;

a permanent magnet rotor having at least two pair of poles journaled and located such that its magnetic field interacts with the electromagnetic field of the stator poles, the rotor poles being alternately magnetically polarized in an annular directions;

rotor position sensing means located to be actuated in predetermined rotor positions to provide rotor positions information;

commutating means for controlling the current in said stator winding means in response to said rotor position sensing means as a function of rotor position to produce an electromagnetic field in said stator;

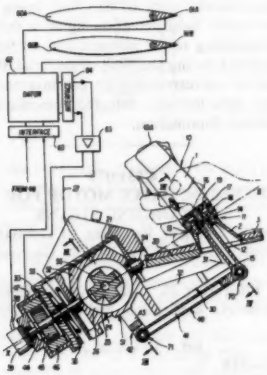
means for providing a detection pulse for rotor position at at least one specific position of each rotation of said rotor, said means including an auxiliary winding wound over at least two adjacent stator poles having an extent of 360 degrees el. with respect to the rotor and further including at least two pole limits of said rotor being displaced circumferentially at the position of 360 degrees el. forming at least two circumferentially small periphery regions having a magnetization opposite to one another wherein, upon rotation of the rotor, the magnetic field of each periphery region induces a pulse in the auxiliary winding.

4,531,080

CONTROLLER

Lennart Nordström, and Tommy Sävström, both of Linköping, Sweden, assignors to Saab-Scania Aktiebolag, Linkoping, Sweden

Filed May 13, 1983, Ser. No. 499,240
Claims priority, application Sweden, Jun. 1, 1982, 8203350
Int. Cl.[3] B64C *13/16*
U.S. Cl. 318—628 **9 Claims**



1. A controller for producing control signal outputs for controlling the actuation of movable elements, of the type comprising a stick-like control section which can be embraced by a hand, a gimbal joint upon which the control section is mounted to swing about a pair of mutually perpendicular stick axes that extend substantially transversely to the length of the control section and intersect at a location to be surrounded by a hand embracing the control section, a signal generator for each said axis for producing a control signal output corresponding to displacement of the control section about the signal generator's axis from a neutral position, stick force generating means for each said axis for biasing the control section towards its neutral position, and motion transmitting means for operatively connecting the control section with the respective signal generators and stick force generating means, said controller being characterized by:

A. means comprising a second gimbal joint having members to which said signal generators and stick force generating means are connected and which are rotatable about a pair of mutually perpendicular gimbal axes, each corresponding to one of said stick axes, that intersect at a point spaced from said location; and

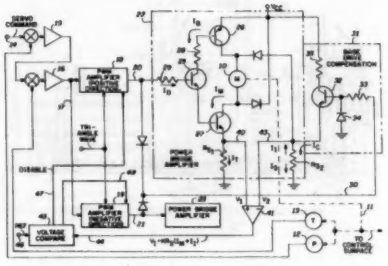
B. motion transmitting means connecting the first mentioned gimbal joint with the members of said second gimbal joint to constrain said members to rotate about their respective gimbal axes in unison with swinging of the control section about the corresponding stick axes.

4,531,081

SERVOMOTOR CONTROL WITH IMPROVED TORQUE LIMITING

Terrence R. Liesegang, Phoenix, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 11, 1983, Ser. No. 474,365
Int. Cl.[3] G05D *23/275*
U.S. Cl. 318—632 **5 Claims**



1. In an autopilot system for aircraft having a servoamplifier and an electric servomotor responsive thereto for driving a control surface of said aircraft in accordance with a servoamplifier command signal, said servoamplifier including a power supply and signal responsive means for limiting the torque output of said servomotor, the combination comprising:

(a) power amplifier means responsive to said command signal and including at least one transistor coupled between said power supply, the control windings of said motor and ground for supplying motor drive current,

(b) means for providing a measure of said motor current, said measuring means being further responsive to the base drive current of said transistor,

(c) base drive compensation circuit means coupled between said power supply and ground for providing a compensation current effectively equal to said base drive current, and

(d) means responsive to said compensation current for cancelling the effect of said base drive current on said motor drive current measureng means.

4,531,082

CONTROL SYSTEM FOR POSITIONING IMPLEMENTS

Hiroshi Yoshinada, Machida; Hiroshi Oshima, Yokohama, and Takashi Ono, Chigasaki, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Aug. 16, 1983, Ser. No. 523,753
Int. Cl.[3] G05B *1/06*
U.S. Cl. 318—663 **1 Claim**

1. A control system for positioning an implement, comprising:

a source of pressurized fluid;

a power steering unit including a rotary valve having a sleeve and a rotary spool rotatably received in the sleeve and metering means operatively associated with the rotary valve for metering pressurized fluid from said source in response to an angular displacement of the rotary spool relative to the sleeve;

an implement pivotally mounted on a body;

cylinder means connected with said power steering unit for angularly displacing said implement;

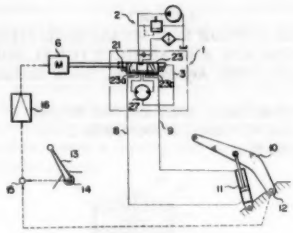
first angular position detector means for detecting an angular displacement of said implement relative to said body;

an operating lever means pivotally mounted on said body for operating said implement;

second angular position detector means for detecting an angular displacement of said operating lever means relative to said body;

a feed back circuit detecting the position of an actuator whereby to avoid displacement of a neutral position of said rotary valve;

comparator means connected with said first and second angular position detector means for comparing signals therefrom and generating an output signal;



amplifier means for receiving the output signal from said comparator means and generating an output signal therefrom;

DC motor means connected with said amplifier means and said rotary spool of said rotary valve for rotating said rotary spool in response to the output signal from said amplifier means; and gear reduction means disposed between said DC motor means and said rotary spool.

4,531,083

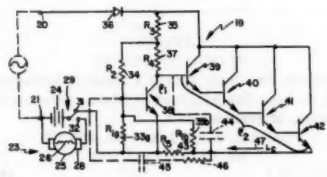
CURRENT REGULATING CIRCUIT

Philip A. Hoffman, Towson, Md., assignor to Solid State Chargers Research and Development Limited Partnership, Lutherville, Md.

Continuation-in-part of Ser. No. 472,758, Mar. 7, 1983, Pat. No. 4,504,774. This application Aug. 18, 1983, Ser. No. 524,357

Int. Cl.³ H01M *10/44*

U.S. Cl. 320—9 **21 Claims**



1. In a current regulating circuit having rectification means for producing a D.C. voltage and amplification means, a feedback control circuit comprising solid state means having first, second and third terminals, the third terminal constituting a control terminal, a current sensing resistance between the amplification means and the control circuit, a first resistor having one end thereof connected to the first terminal via said current sensing resistance and the other end thereof connected to the control terminal of the solid state means, a second resistor having one end thereof connected to the control terminal, and a third resistor having one end thereof connected to receive the D.C. voltage, the other end of the second resistor being connected to the other end of the third resistor, further including a fourth resistor connected between the second terminal of the solid state means and the other end of the third resistor, and

wherein the individual resistance values of the four resistors can vary substantially and are not nearly as important as the ratios between the first, second and third resistors to the fourth resistor, respectively.

4,531,084

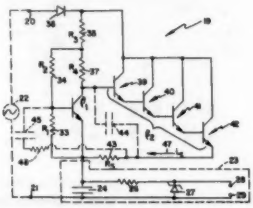
POWER SUPPLY WITH CURRENT REGULATING CIRCUIT

Philip A. Hoffman, Towson, Md., assignor to Solid State Chargers Research and Development Limited Partnership

Continuation-in-part of Ser. No. 472,758, Mar. 7, 1983, Pat. No. 4,504,774. This application Aug. 18, 1983, Ser. No. 524,356

Int. Cl.³ H02J *7/04*

U.S. Cl. 320—39 **56 Claims**



1. In a power supply which includes smoothing circuit means, a current regulating circuit comprising rectification means, amplification means and a feedback control circuit comprising solid state means having first, second and third terminals, the third terminal being a control terminal, a first resistance having one end thereof coupled to said first terminal and the other end thereof connected to the control terminal of the solid state means, a second resistance having one end thereof connected to the control terminal and a third resistance in a series circuit with the smoothing circuit means and the rectification means, one end of said third resistance being connected to the other end of the second resistance, a fourth resistance connected between the second terminal of the solid state means and the one end of the third resistance, and

wherein the individual resistance values of the four resistances can vary substantially and are not nearly as important as the ratios between the first, second and third resistances to the fourth resistance, respectively.

4,531,085

POLYPHASE LINE VOLTAGE REGULATOR

Lee O. Mesenhimer, Avon, Ohio, assignor to Power Distribution Inc., Richmond, Va.

Filed Jun. 13, 1983, Ser. No. 503,539

Int. Cl.³ G05F *3/06*

U.S. Cl. 323—214 **7 Claims**

1. A polyphase line voltage regulator for use with an unregulated a.c. source of variable voltage level and waveshape and of a given frequency for providing a regulated a.c. voltage output to a load having a variable current demand which comprises:

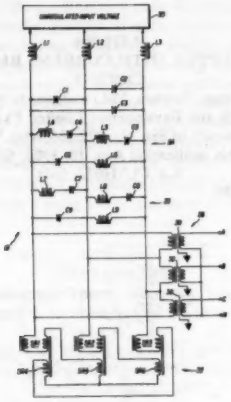
a. input inductor means each coupling one phase of unregulated input voltage to one phase of a regulated output voltage,

1. said input inductor means being provided with controlled non-linearity,

b. a main a.c. capacitor bank connected in delta across the regulated voltage,

c. LC tuned circuits connected across said capacitor bank and tuned to the second and third harmonics of said unregulated a.c. source,

d. polyphase pulse saturable reactor means connected across said capacitor bank to regulate the voltage,



e. and isolation transformer means connected across said polyphase pulse saturable reactor means to deliver a regulated a.c. voltage output to said load.

4,531,086

DEVICE FOR STABILIZING THE VOLTAGE OF A SINGLE- OR MULTI-PHASE A-C NETWORK

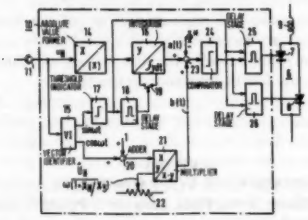
Eberhard Schmid, Dormitz, and Robert Brehler, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 2, 1982, Ser. No. 446,334

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1981, 3149706

Int. Cl.³ G05F *1/60*

U.S. Cl. 323—222 **3 Claims**



1. In a device for stabilizing the voltage between two conductors of an a-c network subject to load fluctuations, said device comprising a pair of circuits connected in parallel between said conductors, a first circuit of said pair including switching means operable for connecting said conductors to one another and choke means in series with said switching means for limiting the current flow between said conductors upon operation of said switching means, a second circuit of said pair including control means with an integrator and at least one threshold indicator operatively connected to said switching means for operating same to connect said conductors to one another upon detecting equality between a predetermined reference value and a computed value representing at least a part of the area under a half-wave portion of a voltage-time curve of said conductors, the improvement wherein said control means includes calculating means for determining, as a component of said computed value, a residual quantity depending on the reactance of said first circuit and representing the area under said voltage-time curve from the instant of operation of said switching means by said control means to the end of said half-wave portion, said control means further including summing means operatively connected to said integrator and said calculating means for forming said computed value as a sum of said residual quantity and a value calculated by said integrator and representing the area under said voltage-time curve from the beginning of said half-wave portion to the instant of operation of said switching means.

4,531,087

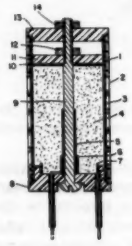
ELECTRICAL SENSOR FOR MEASURING MOISTURE IN LANDSCAPE AND AGRICULTURAL SOILS

Glenn F. Larson, 1042 Arbolado Rd., Santa Barbara, Calif. 93103

Filed Jun. 9, 1982, Ser. No. 386,693

Int. Cl.³ A01G *25/00*; G01R *27/02*

U.S. Cl. 324—65 P **1 Claim**



1. An electrical conductivity sensor for the measurement of moisture in a soil medium comprising:

a granulous porous medium;

at least two electrodes imbedded in said granulous medium;

a layer of filter cloth surrounding said porous medium for separating it from said soil medium;

a rigid support structure holding said filter cloth in place around said granulous porous medium and allowing a free exchange of moisture between said soil medium and said granulous porous medium.

4,531,088

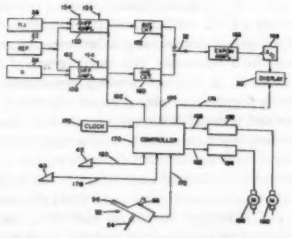
BLOOD ANALYSIS

John D. Czaban, Bradford; Alan D. Cormier, Newburyport, and Kenneth D. Legg, Wellesley, all of Mass., assignors to Allied Corporation, Morristown, N.J.

Filed Aug. 6, 1982, Ser. No. 405,870

Int. Cl.³ G01N *27/00*

U.S. Cl. 324—71.1 **14 Claims**



1. An analysis system of the potentiometric type comprising means for supplying a sample fluid to be analyzed,

structure defining a sample flow path that has an inlet at one end and an outlet at its other end, the inlet of said sample

flow path being connected to said sample supplying means,

an electrode array connected to said sample flow path, said electrode array including a reference electrode system that has a liquid junction of the restricted diffusion type and a measuring electrode system that has an ion-selective surface portion for measuring the concentration of a constituent of interest in the sample fluid to be analyzed, liquid junction and said ion-selective surface portion defining in part said sample flow path,

flow means connected to said flow path for flowing the sample to be analyzed from said sample supplying means past said electrode systems, and

data acquisition means, and control means for enabling said data acquisition means to sense the electrical potential across said electrode systems to acquire data on the concentration of a constituent of interest in the sample while said flow means is flowing said sample past said series of electrode systems.

4,531,089

ELECTRIC POWER DETECTING CIRCUIT AND GAIN CONTROL CIRCUIT USING THE SAME

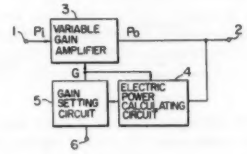
Kohei Ishizuka; Yasuhiro Kita, both of Hachioji; Narimichi Maeda, Tachikawa, all of Japan; Masahiro Koya, Mountain View, Calif.; Kazuhiko Takaoka, Tokyo, and Yoshiro Kokuryo, Kodaira, both of Japan, assignors to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha, both of Tokyo, Japan

Filed Feb. 11, 1982, Ser. No. 348,013

Claims priority, application Japan, Feb. 20, 1981, 56-23110

Int. Cl.³ G01R *17/06, 1/30, 21/00*

U.S. Cl. 324—99 D **7 Claims**



1. A gain control circuit comprising:

a variable gain amplifier,

a measuring circuit for detecting output electric power of said variable gain amplifier,

a gain setting circuit coupled to the variable gain amplifier for generating a gain control signal controlling the gain of the variable gain amplifier, and

a calculating circuit coupled to the output of the measuring circuit and to the output of the gain setting circuit for detecting input electric power of said variable gain amplifier on the basis of said gain control signal and the output signal of said measuring circuit,

said gain setting circuit being controlled by an output of said calculating circuit to adjust said gain control signal in order to settle the output electric power of said variable gain amplifier to a predetermined value on the basis of the output signal of said calculating circuit and said predetermined value.

4,531,090

POSITION TRANSDUCER FOR AN INTERNAL COMBUSTION ENGINE FUNCTION CONTROL SYSTEM

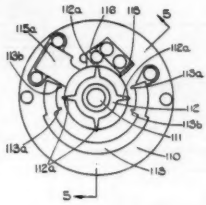
William F. Hill, Stafford, England, assignor to Lucas Industries, Birmingham, England

Division of Ser. No. 379,705, May 19, 1982, Pat. No. 4,485,785. This application Mar. 26, 1984, Ser. No. 593,431

Claims priority, application United Kingdom, Jun. 5, 1981, 8117293; Apr. 8, 1982, 8210580

Int. Cl.³ G01B *7/14;* **F02P** *5/08*

U.S. Cl. 324—208 **2 Claims**



1. A transducer comprising:

a body having at least one protuberance;

a rotary part mounted on the body and having at least one protruberance;

first means for producing magnetic flux, said protuberances and said first magnetic flux producing means forming part of a first magnetic circuit the reluctance of which varies as the rotary part rotates relative to the body;

a movable element having at least one protuberance and being mounted on the body so as to be angularly movable relative to the body and independently movable relative to the rotary part;

second means for producing magnetic flux and arranged to provide an opposite direction of magnetic flux to the first magnetic flux producing means, said at least one protuberance on the rotary part, said at least one protuberance on the movable element and said second magnetic flux producing means together forming a part of a second magnetic circuit the reluctance of which varies as the rotary part rotates relative to the movable element;

a pick-up winding magnetically linked with both said first magnetic circuit and said second magnetic circuit in which an electrical signal is generated as a result of the change in reluctance in said magnetic circuits as the rotary part is turned relative to the body; and

a discriminating circuit connected to the pick-up winding and providing distinct output signals in response to the at least one protuberance on the rotary part passing close to the at least one protuberance on the body and the at least one protuberance on the rotary part passing close to the at least one protuberance on the movable element.

4,531,091

MAGNETIC INSPECTION OF REINFORCING STEEL USING SENSOR ARRAY

Felix N. Kusenberger; Albert S. Lozano, and Wilson B. Tarver, Jr., all of San Antonio, Tex., assignors to The United States of America as represented by the Secretary of Transportation, Washington, D.C.

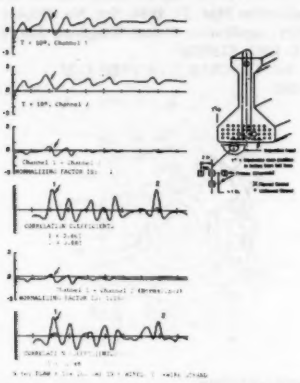
Filed Mar. 29, 1982, Ser. No. 363,219

Int. Cl.³ G01N *27/82;* **G01R** *33/12*

U.S. Cl. 324—242 **5 Claims**

1. In the method of inspecting the reinforcing members in prestressed concrete by generating a magnetic field which extends to the reinforcing members, obtaining an analog equivalent of the field by means of a sensor located within the magnetic field, and recording the analog equivalent of all points along the length of the members, the improvement which

comprises: obtaining an analog equivalent of the magnetic field from a plurality of sensors located within said magnetic field and recording the output of each sensor separately in the form of a graph, said sensors being in a plane which is perpendicular



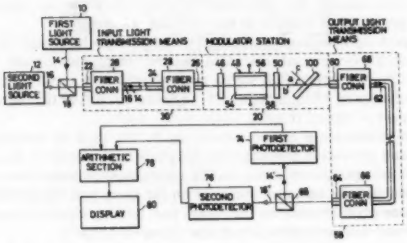
to the reinforcing members and arranged in an array of 2 rows, with the first row comprising three sensors nearest the reinforcing members and the second row comprising one sensor below the middle sensor in said first row.

4,531,092

OPTOELECTRONIC SYSTEM FOR MEASURING ELECTRIC OR MAGNETIC QUANTITIES UTILIZING A DUAL LIGHT BEAM OF DIFFERENT WAVELENGTHS

Fumehiko Shibano, Ome, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed May 12, 1982, Ser. No. 377,583
Claims priority, application Japan, May 28, 1981, 56-81988
Int. Cl.³ G01R *33/032, 29/12*
U.S. Cl. 324—244 **17 Claims**



1. A method of optoelectronically measuring electric quantities such as voltages, charges and current magnitudes, or magnetic quantities such as magnetic field strengths, which comprises:

(a) generating first and second beams of light of different wavelengths at a substantially predetermined ratio of intensities;

(b) combining the first and second beams;

(c) transmitting the combined first and second beams over a first common path;

(d) polarizing the first and second beams;

(e) modulating the phases of the polarized first and second beams in accordance with a desired quantity of electricity or magnetism to be measured;

(f) modulating the intensities of the phase modulated first and second beams by a wavelength-dependent, selective polarizing filter whereby the first beam is polarized into an intensity-modulated beam whereas the second beam is passed unpolarized as a non-intensity-modulated beam;

(g) transmitting the intensity-modulated first beam and the non-intensity-modulated second beam over a second common path;

(h) spatially separating the intensity-modulated first beam and the non-intensity-modulated second beam from each other;

(i) sensing the intensities of the intensity-modulated first beam and the non-intensity-modulated second beam; and

(j) computing the desired quantity by the formula:

$$D = f^{-1}(\lambda 1, \frac{I_{1o}}{I_{2o}} \cdot \frac{I_{2i}}{I_{1i}})$$

where:

D=the quantity to be measured;

f^{-}=an inverse function determined by the beam modulation characteristic;

$\lambda 1$=the wavelength of the first beam;

I_{1i}=the initial intensity of the first beam;

I_{2i}=the initial intensity of the second beam;

I_{1o}=the sensed intensity of the intensity-modulated first beam; and

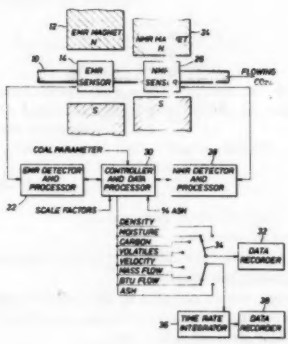
I_{2o}=the sensed intensity of the non-intensity-modulated second beam.

4,531,093

METHOD AND APPARATUS FOR COAL ANALYSIS AND FLOW MEASUREMENT

William L. Rollwitz, and James D. King, both of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed May 5, 1983, Ser. No. 491,869
Int. Cl.³ G01R *33/08*
U.S. Cl. 324—300 **45 Claims**



1. A method of measuring the heat content of coal comprising the steps of:

(a) measuring the nuclear magnetic resonance (NMR) response of hydrogen in the coal;

(b) measuring the electron magnetic resonance (EMR) of free electrons in the coal; and

(c) determining the heat content of the coal as a function of the hydrogen NMR and the EMR measurements wherein the step of determining includes the step of comparing with a standard value derived from a known coal assay.

4,531,094
METHODS AND APPARATUS OF OBTAINING NMR SPECTRA

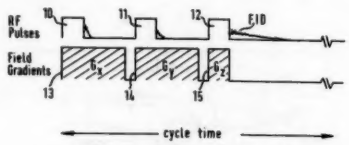
Roger J. Ordidge, Nottingham, and Robert E. Gordon, Oxford, both of England, assignors to Oxford Research Systems Limited, Oxford, England

Filed Feb. 7, 1983, Ser. No. 464,139

Claims priority, application United Kingdom, Feb. 9, 1982, 8203685

Int. Cl.³ G01R *33/08*

U.S. Cl. 324—309 **21 Claims**



1. A method of obtaining an N.M.R. spectrum from a sample, which method comprises maintaining along an axis of the sample of magnetic field which is homogeneous over at least a small volume constituting part of the sample,

applying to the magnetic field a magnetic field gradient in a first direction, applying to the sample in the presence of the said field gradient an rf pulse to effect the selective saturation of all nuclei of a particular type in the said volume, except for those lying in a slice normal to the said first direction,

replacing the field gradient in the first direction by a field gradient in a second direction, orthogonal to the said first direction, and applying to the sample in the presence of the field gradient in the second direction an rf pulse to effect the selective saturation of all nuclei of the said type in the said volume, except for those lying in a slice normal to the said second direction, whereby nuclei in only a narrow column, orthogonal to both the first and second said directions, are unsaturated,

replacing the field gradient in the said second direction by a field gradient in a third direction, orthogonal to each of the said first and second directions, applying to the sample in the presence of the field gradient in the third direction an rf pulse to selectively interact with nuclei in the said column, and obtaining, in the substantial absence of applied field gradients, an output signal indicative of the free induction decay of the said selectively affected nuclei.

4,531,095
IMPULSE NOISE REDUCTION BY LINEAR INTERPOLATION HAVING IMMUNITY TO WHITE NOISE

Yukinobu Ishigaki, Tokyo, and Kazutoshi Hirohashi, Yokohama, both of Japan, assignors to Victor Company of Japan, Limited, Japan

Filed Mar. 2, 1984, Ser. No. 585,926

Claims priority, application Japan, Mar. 7, 1983, 58-37130; Mar. 7, 1983, 58-37131

Int. Cl.³ H03B *1/04*

U.S. Cl. 328—165 **6 Claims**

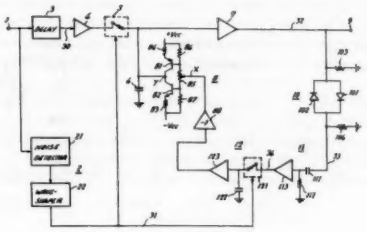
1. A noise reduction circuit having an input terminal to which an analog audio signal is applied and an output terminal from which a noise-suppressed audio signal is delivered, comprising:

means coupled to said input terminal for generating a sampling pulse in response to an impulse noise introduced to said analog signal;

a first sample-and-hold circuit having a capacitor, switch means provided in a signal transmission path from said input terminal to said output terminal and to said capacitor, said switch means being responsive to said sampling pulse for disconnecting said signal transmission path to said output terminal and to said capacitor for sampling said analog signal into said capacitor;

a transfer circuit coupled to the output of the first sample-and-hold circuit, the transfer circuit having a nonlinear input-output characteristic for eliminating white noise;

a differentiator coupled to the output of the transfer circuit for generating a signal representative of the slope ratio of said analog signal;



a second sample-and-hold circuit coupled to the output of the differentiator for sampling said slope ratio signal in response to said sampling pulse; and

a constant current charging and discharging circuit coupled to said capacitor for linearly charging and discharging said capacitor in response to the signal sampled by said second sample-and-hold circuit.

4,531,096
PULSE-WIDTH MODULATION CIRCUIT

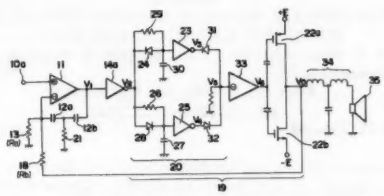
Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Sep. 28, 1983, Ser. No. 536,497

Claims priority, application Japan, Oct. 9, 1982, 57-177989

Int. Cl.³ H03F *3/38*

U.S. Cl. 330—10 **12 Claims**



1. A pulse-width modulation circuit which comprises:

(a) amplifier means for amplifying an input signal inputted thereto to develop an amplified output signal from an output terminal thereof, said amplifier means having an inverting input terminal;

(b) capacitor means connected between the inverting input and output terminals of said amplifier means;

(c) comparator means for comparing the output signal of said amplifier means with a reference voltage to output a pulse signal, a pulse width of said pulse signal varying in accordance with a signal level of the output signal of said amplifier means;

(d) delay circuit means responsive to said pulse signal for producing an output pulse signal in delayed relation to said pulse signal for a certain period of time; and

(e) feedback circuit means for feeding the output pulse signal of said delay circuit means back to the inverting input terminal of said amplifier means;

(f) whereby a pulse-width modulated signal having a pulse width corresponding to an amplitude of said input signal appears at an output terminal of said delay circuit means.

4,531,097
HIGH FREQUENCY AMPLIFIER

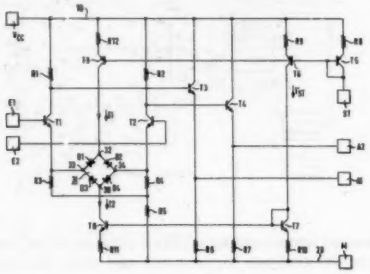
Laszlo Götz, Oberding, and Hermann Kowatsch, Ebenhausen, both of Fed. Rep. of Germany, assignors to Texas Instruments Deutschland GmbH, Freising, Fed. Rep. of Germany

Filed Jun. 21, 1983, Ser. No. 506,180

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1982, 3223229

Int. Cl.³ H03F 3/45

U.S. Cl. 330—254 8 Claims



4. A high frequency amplifier comprising a pair of transistors forming a differential amplifier stage, means connected to the transistors for biasing them at an operating point, variable impedance means connecting the emitters of the transistors for varying the amplification factor of the amplifier, wherein the variable impedance means comprises a diode bridge having a pair of a.c. terminals connected to the emitters of the transistors, and a controllable current source means connected to a pair of d.c. terminals of the bridge for feeding a d.c. control circuit to the diode bridge to vary the impedance of the bridge and the amplification factor of the amplifier without substantially changing the operating point of the said transistors.

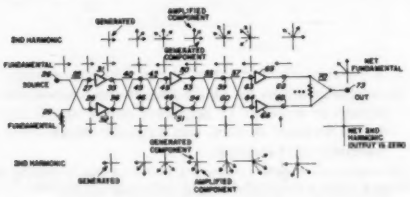
4,531,098
WIDE DYNAMIC RANGE AMPLIFIER WITH SECOND HARMONIC SIGNAL CANCELLATION

John C. Reed, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 5, 1984, Ser. No. 596,963

Int. Cl.³ H03F 1/26, 3/60

U.S. Cl. 330—53 9 Claims



1. A wide dynamic range amplifier with second harmonic signal concellation comprising:

a quadrature coupler having an input adapted to receive a signal to be amplified and a pair of outputs having output signals thereon which are in phase quadrature;

amplifying means coupled to the pair of outputs for amplifying each of the output signals and providing two amplified output signals including second harmonic signals 180° out of phase; and

an in-phase power divider having two inputs coupled to receive the two amplified output signals, said power divider combining the two signals to provide at an output thereof a single signal substantially free of second harmonic signals.

4,531,099
AMPLIFIER

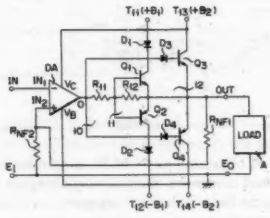
Hiroshi Nakane, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 19, 1983, Ser. No. 486,516

Claims priority, application Japan, Apr. 20, 1982, 57-65798

Int. Cl.³ H03F 3/30

U.S. Cl. 330—267 3 Claims



1. An amplifier comprising:

input and output terminals;

drive circuit means for receiving a signal from said input terminal and providing a drive signal at an output thereof;

judging means, having first and second resistors coupled in series between said drive circuit means output and said amplifier output terminal and first and second diodes, each having a first end commonly connected to said drive circuit means output, for judging an amplitude of said drive signal;

first power amplifying circuit means, including a first pair of complementary transistors having their bases commonly connected to the junction of said first and second resistors and their emitters commonly connected to said amplifier output terminal, for amplifying said drive signal;

second power amplifying circuit means, including a second pair of complementary transistors having their bases respectively connected to respective second ends of said first and second diodes and their emitters commonly connected to said amplifier output terminal, for amplifying said drive signal;

first power supply means for supplying positive and negative first source voltages ($+B_1$, $-B_1$) to the respective collectors of said first pair of complementary transistors; and

second power supply means for supplying positive and negative second source voltages ($+B_2$, $-B_2$) to the respective collectors of said second pair of complementary transistors, said first and second source voltages satisfying:

$+B_2 > +B_1$ and $-B_2 < -B_1$, whereby said second power amplifying circuit means amplifies said drive signal only when said drive signal is greater than a predctermined level.

4,531,100
AMPLIFIER SUITABLE FOR LOW SUPPLY VOLTAGE OPERATION

Francis W. Adkin, 5 Cosway Mansions, Cosway St., London, N.W.1., England

PCT No. PCT/GB82/00321, § 371 Date Jul. 11, 1983, § 102(e) Date Jul. 11, 1983, PCT Pub. No. WO83/01714, PCT Pub. Date May 11, 1983

PCT Filed Nov. 10, 1982, Ser. No. 522,166

Claims priority, application United Kingdom, Nov. 10, 1981, 8133807

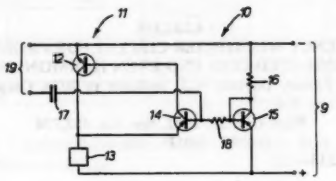
Int. Cl.³ H03F 3/04

U.S. Cl. 330—290 6 Claims

1. In an amplifier system including a direct-current voltage source (9), an output load element (13), a signal output amplifying stage (11) including a first transistor (12) having a pair of

load circuit electrodes connected in series with said output load element to define a series path connected across said voltage source, and a control stage (**10**) for controlling the operation of said signal amplifying stage;

the improvement wherein said control stage comprises clamping means (**14, 15**) for controlling the D.C. current through said series path in dependence on the voltage across the output load element, thereby to clamp the voltage excursion peaks of one polarity which appear between said first transistor and said output load element to a voltage related to that at the opposite side of the



output load element, whereby the amplifier system is operable for a minimum supply voltage at about 0.85 volts, said clamping means including

(a) a second transistor (**14**) having a main current path connected at one end with said series path between said first transistor and said output load element, the other end of said main current path being connected with the control electrode of said first transistor; and

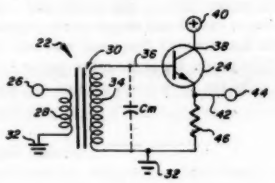
(b) means (**15**) for controlling the direct-current bias of the control electrode of said second transistor in dependence on the voltage across the output load element.

4,531,101

HIGH-FREQUENCY AMPLIFIER WITH ENHANCED GAIN FROM USE OF THE MILLER EFFECT CAPACITANCE

Joseph P. Pecukonis, Littleton, Colo., assignor to Pasar, Inc., Denver, Colo.

Filed Aug. 22, 1984, Ser. No. 643,672
Int. Cl.³ H03F *3/04*
U.S. Cl. 330—302 **19 Claims**



1. A relatively high-frequency amplifier which employs a Miller effect capacitance to enhance gain at a relatively high predetermined signal frequency, comprising:

a transistor having an emitter terminal, a base terminal and a collector terminal, the transistor also having an inherent base-to-collector capacitance which is effectively magnified at the predetermined signal frequency as a Miller effect capacitance of an approximate value equal to the gain of the transistor multiplied by the value of the inherent base-to-collector capacitance;

input inductor means having a primary winding to which an amplifier input signal is applied and a secondary winding in which a signal is induced by the input inductor means from the application of the amplifier input signal to the primary winding, the primary winding having a predetermined number of coil turns and the secondary winding having a predetermined number of coil turns;

load means electrically connected to the emitter terminal and from which an amplifier output signal is derived;

means electrically connecting the secondary winding to the base terminal;

means electrically connected to the collector terminal of the transistor and operative in conjunction with the load means connected to the emitter terminal to place the transistor in an emitter follower configuration, the means electrically connected to the collector terminal also being electrically effective to connect the Miller effect capacitance in a resonant circuit relationship with and including the secondary winding; and

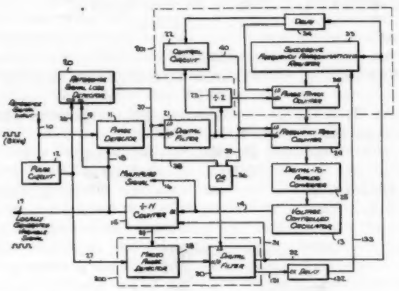
wherein the gain of said amplifier is substantially established by the ratio of coil turns of the secondary winding to the coil turns of the primary winding multiplied by the square root of the "Q" of the resonant circuit including the Miller effect capacitance and the effective inductance of the secondary winding.

4,531,102

DIGITAL PHASE LOCK LOOP SYSTEM

Jonathan B. Whitlock, Bernardsville, and Christopher W. Drzala, Paramus, both of N.J., assignors to GK Technologies, Incorporated, Greenwich, Conn.

Filed Feb. 28, 1983, Ser. No. 470,134
Int. Cl.³ H03L *7/06*
U.S. Cl. 331—1 A **20 Claims**



1. A phase lock loop system for synchronizing the frequency and phase of a locally generated alternating current signal with a reference signal comprising in combination an oscillator whose frequency can be varied by application thereto of a control signal, means coupled responsively to said oscillator for providing said locally generated signal at a frequency that is equal to 1/N times said oscillator frequency where N is a positive integer, means for storing a first count and having an output, means coupled to said output of said first count storing means and to said oscillator for providing said control signal to vary the frequency of said oscillator as a function of said first count, means responsively coupled to receive said reference signal and compare the phase thereof with said locally generated signal for providing output signals indicative of a leading or lagging phase relationship, respectively, and means for coupling said last mentioned output signals to said first count storing means for changing said first count in a direction tending to bring said locally generated signal into frequency and phase coincidence with said reference signal; said output signal coupling means including means for changing said first count from a first value to a second value in one direction in response to said output signals corresponding to a leading phase relationship and in the opposite direction in response to said output signals corresponding to a lagging phase relationship, and means responsive to each change of said output signals that is

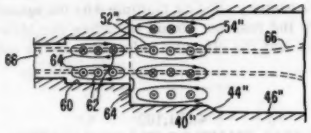
indicative of a reversal in sign of said phase relationship for replacing said first count in said first count storing means with another first count having a value half way between the last occurring first and second values.

4,531,103

MULTIDIAMETER CAVITY FOR REDUCED MODE COMPETITION IN GYROTRON OSCILLATOR

Steven J. Evans, Mountain View, and Robert S. Symons, Los Altos, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Dec. 10, 1982, Ser. No. 448,663
Int. Cl.³ H03B 9/08
U.S. Cl. 331—83 **8 Claims**



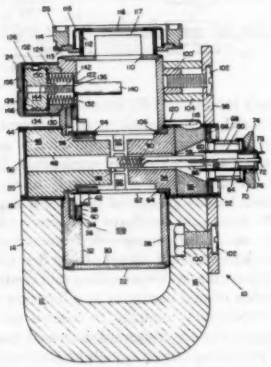
1. A gyrotron oscillator comprising a resonant cavity for supporting a standing electromagnetic wave in energy-exchanging relationship with an electron beam, the improvement being that said cavity comprises a plurality of sequential sections along the drift axis of said beam, a first upstream section having a smaller cross-section perpendicular to said axis than a second downstream section the change between cross sections being abrupt in the axial direction.

4,531,104

TUNABLE MAGNETRON OF THE COAXIAL-VACUUM TYPE

Gregory T. Schaeffer, Williamsport, Pa., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Nov. 29, 1982, Ser. No. 445,122
Int. Cl.³ H03B 9/10; H01J 25/50
U.S. Cl. 331—90 **22 Claims**



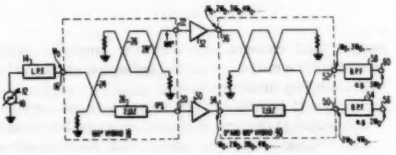
1. A tunable coaxial magnetron, comprising:
cathode means;
anode means including vaned anodes surrounding said cathode means to define an interaction space therebetween;
housing means surrounding said anode means forming a cavity thereabout;
said anode means having apertures between selected vaned anodes for operating said interaction space to said cavity;
a tuning housing mounted upon said housing means;
a tuning nut rotatably retained within said tuning housing;
a threaded shaft passing through said tuning housing;
bellows means mounted within said tuning housing for enclosing said threaded shaft; and
an elongated tuning member attached to said bellows means having an axis in said elongated direction along which said tuning member is adjusted into and out of said cavity by rotation of said tuning nut for adjusting the output frequency of said coaxial magnetron.

4,531,105

FREQUENCY MULTIPLIER CIRCUIT FOR PRODUCING ISOLATED ODD AND EVEN HARMONICS

Mahesh Kumar, Dayton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 23, 1982, Ser. No. 452,774
Int. Cl.³ H01P 5/16, 1/213
U.S. Cl. 333—117 **6 Claims**



1. A microwave frequency multiplier for producing isolated odd and even harmonics of an input signal at a fundamental frequency, comprising in combination:
a 180° hybrid receptive at an input port of said input signal for producing at first and second output ports thereof a signal at the fundamental frequency, the signal at the output ports being phased 180° apart;
first and second non-linear active devices, each having an input terminal coupled to a respective one of said first and second output ports and having an output terminal for producing a signal at said fundamental frequency and even and odd harmonics thereof; and
a 0° and 180° hybrid having first and second input ports coupled respectively to the respective output terminals of said first and second devices and having two output ports for producing at one of said output ports a signal containing only the fundamental frequency and odd harmonics thereof and for producing at the other output port a signal containing only the even harmonics of the fundamental frequency.

4,531,106

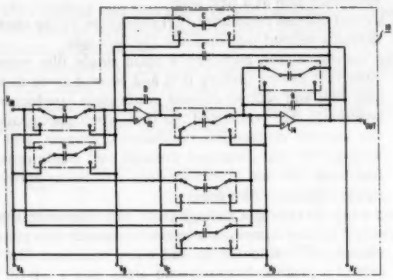
SWITCHED CAPACITOR CIRCUITS

Apparajan Ganesan, Indianapolis, Ind., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Oct. 4, 1983, Ser. No. 539,004
Int. Cl.³ H03H 19/00; G11C 27/02
U.S. Cl. 333—173 **6 Claims**

1. An electronic circuit, comprising:
a first amplifier having first and second input ports and an output port, one of the input ports being connected to a first reference voltage;
a first capacitor adapted to receive an input signal at one side;
first switch means for connecting the other side of the first capacitor alternately to the other input port of the first amplifier and to the first reference voltage;
a second capacitor, and

a second switch means for connecting one side of the second capacitor alternately to the first amplifier output port and



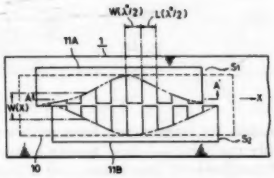
to a second reference voltage, different from the first reference voltage.

4,531,107

ACOUSTIC SURFACE WAVE DEVICE

Takeshi Okamoto; Shoichi Minagawa, and Teruo Niitsuma, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Jul. 6, 1983, Ser. No. 511,500
Claims priority, application Japan, Jul. 6, 1982, 57-118059
Int. Cl.³ H03H *9/145, 9/64*
U.S. Cl. 333—194 **10 Claims**



1. In an acoustic wave device for the production or sensing of a surface acoustical wave of a chosen frequency traveling in a given direction along a substrate, the improvement comprising:

an elastic substrate;

a lower electrode disposed on said elastic substrate;

a piezoelectric film disposed so as to cover said lower electrode; and

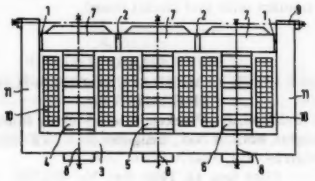
an upper electrode structure including at least two comb-shaped electrodes disposed spaced apart from each other on said piezoelectric film and generally confronting said lower electrode, each of said electrodes including a plurality of electrically conducting and electrically interconnected parallel fingers disposed transversely to said direction of propagation, the lengths of said fingers and the configuration of said lower electrode being adjusted so that the areas of confrontation between said lower electrode and the fingers of said electrodes varies among said fingers to produce a chosen frequency response characteristic, said two electrodes being disposed so that the fingers of one do not interdigitatingly overlap the fingers of the other.

4,531,108

THREE-PHASE CHOKE WITH A FIVE-LEG CORE

Donald Brandes, Filderstadt, Fed. Rep. of Germany, assignor to Transformation Union Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Feb. 17, 1984, Ser. No. 581,322
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1983, 3305708
Int. Cl.³ H01F *33/00, 27/24*
U.S. Cl. 336—5 **4 Claims**



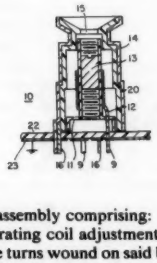
1. Three-phase choke, comprising a five-leg core formed of a central core leg having a winding disposed thereon, two outer core legs each having a respective winding disposed thereon and two return legs, said central and outer core legs being formed of stacks of laminations, a lower yoke having ends adjacent said return legs, an upper yoke formed of sections having ends defining gaps between said ends of said sections, and gaps between said return legs and said ends of said sections of said upper yoke adjacent thereto, nonmagnetic material filling said gaps, at least said upper yoke being subdivided into three yoke sections of substantially equal size each being associated with one of said core legs, and axial clamping devices each individually holding a respective one of said yoke sections on place, said yokes and return legs having cross sections being smaller than the cross sections of said core legs, each of said return legs and said ends of said yokes adjacent thereto having a first magnetic resistance, said upper yoke having a respective portion thereof disposed between said central core leg and each of said outer core legs each having a second magnetic resistance, and said lower yoke having a respective portion thereof disposed between said central core leg and each of said outer core legs each having a third magnetic resistance, said magnetic reistances being substantially determined by the thickness of said gaps, and the sum of one of said second and one of said third magnetic resistances being greater than one of said first magnetic resistances.

4,531,109

TUNING COIL STRUCTURE

Perry C. Olsen, Noblesville, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 28, 1983, Ser. No. 479,448
Int. Cl.³ H01F *21/08*
U.S. Cl. 336—87 **14 Claims**



1. A tuning coil assembly comprising:

a bobbin incorporating coil adjustment means;

a plurality of wire turns wound on said bobbin to form a coil;

a rigid nonmetallic coil support sleeve surrounding said coil

and bobbin, a portion of said coil support sleeve conformed closely to said bobbin such that the transverse position of said bobbin is fixed within said support sleeve to aid in adjusting said coil adjustment means;

terminal members for insertion into an electrical circuit board attached to said nonmetallic coil support sleeve; and

a thin metallic coating, deposited on the outer surface of said nonmetallic coil support sleeve and conforming thereto to provide electrical shielding for said coil from external electromagnetic fields, said coating being electrically connected to said terminal members for providing electrical contact with said circuit board.

4,531,110

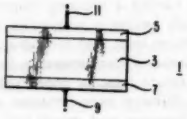
NEGATIVE TEMPERATURE COEFFICIENT THERMISTORS

David W. Johnson, Jr., Pluckemin, and Murray Robbins, Berkeley Heights, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 14, 1981, Ser. No. 301,721

Int. Cl.³ H01C *7/04*

U.S. Cl. 338—22 R **13 Claims**



1. A thermistor comprising a first layer of material having the nominal atom composition $M_{1-x}Fe_{2+x-z}R_zO_4$, where M is at least one element selected from the group consisting of Mn and Mg, x is greater than or equal to 0.0 and less than or equal to 0.3, R is selected from the group consisting of Al and Ti, z is greater than or equal to 0.0 and less than or equal to 1.2, and electrical contacts on opposed surfaces of said layer, and a second and a third layer of material having the composition $M_{1-x}Fe_{2+x-z}R_zO_{4+\beta}$, said β being greater than 0.0 and less than 0.2, said layers being disposed intermediate said first layer and said electrical contacts.

4,531,111

VOLTAGE DIVIDER IN THIN- OR THICK-FILM TECHNOLOGY

Lothar Schmidt, Stuttgart, and Ulrich Goebel, Reutlingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart

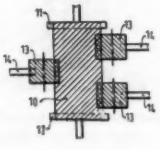
PCT No. PCT/DE82/00209, § 371 Date Jul. 6, 1983, § 102(e) Date Jul. 6, 1983, PCT Pub. No. WO83/01708, PCT Pub. Date May 11, 1983

PCT Filed Oct. 28, 1982, Ser. No. 513,961

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1981, 3144252

Int. Cl.³ H01C *10/16*

U.S. Cl. 338—195 **15 Claims**



1. A calibratable voltage divider, to provide a calibrated take-off voltage, having

a resistance film (R1, 10) having a geometric aspect which defines two opposite sides;

a first current connection conductor (11) connected to the resistance film at a first side;

a second current conductor (12) connected to the resistance film at a second side opposite the first side;

the resistance film including a main single film resistance zone (10) having unitary first and second areas to which said first and second current connection conductors, respectively, are connected, so that, upon energization of the current connection conductors, current will flow through the end areas and through said single resistance film zone (10) and a voltage drop will occur across said single resistance film zone;

and a tap, to tap-off a voltage from said resistance zone,

wherein the tap comprises a second resistance film zone (13) electrically connected to said main resistance film zone (10) at a position between said areas, and a tap-off electrode (14) electrically connected to said second resistance film zone (13); and wherein the second resistance film zone has a resistance value calibrated to provide the desired tap-off voltage

whereby, upon calibration of the second resistance film zone (13), the resistance value of the main resistance film zone (10) is not essentially affected.

4,531,112

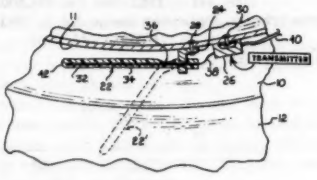
METHOD AND APPARATUS FOR TRANSMITTING FROM WITHIN A PNEUMATIC WHEEL ASSEMBLY

Stephen E. Thomas, 4015 Heron Pl., Fremont, Calif. 94536

Filed Jun. 17, 1982, Ser. No. 389,427

Int. Cl.³ B60C *23/02, 23/04;* H01Q *1/32*

U.S. Cl. 340—58 **11 Claims**



1. An apparatus for transmitting from within a pneumatic wheel assembly including a wheel having a pair of rim lips flanking a circumferential depression, and a pneumatic tire mounted on said wheel in engagement with said rim lips, said apparatus comprising:

a transmitter antenna;

means coupling a portion of said antenna within said circumferential depression of said wheel such that a free end of said antenna may extend beyond said rim lips into the void of said pneumatic tire;

means biasing said free end towards said wheel, whereby said antenna is positioned substantially within said circumferential depression in the absence of a counter-biasing force upon said free end; and

transmitter means attached to said wheel and having an output coupled to said antenna.

4,531,113

CAPACITOR ARRAY

Leonard G. Abraham, Stow, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jun. 27, 1983, Ser. No. 508,363

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 C **12 Claims**

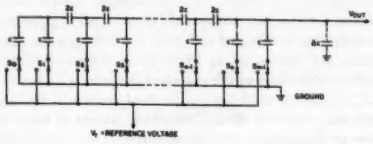
1. A capacitor array for a companded pulse-code modulation voice codec comprising

a first plurality m of capacitors having a common capaci-

tance C, each, and each of said capacitors having a first plate and a second plate;

a plurality of switching means for individually and selectively coupling said first plates of said capacitors to either a first point of reference potential or to a second point of reference potential; and

a second plurality n of capacitors having a common capacitance 2C, each, coupled in series to form a plurality (n+1) of junctions, each of said junctions being coupled to a separate one of said second plates,



a plurality of MOS transistors, each having a drain electrode, a source electrode, and a gate electrode;

means for coupling said drain electrodes, respectively, to said junctions;

means for coupling said source electrodes to said first point of reference potential; and

means for coupling said gate electrodes to an enabling signal, wherein m and n are integers, and wherein the value of 2C is twice the value of C.

4,531,114

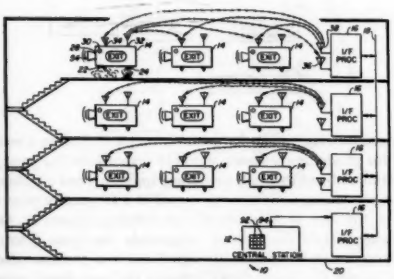
INTELLIGENT FIRE SAFETY SYSTEM

Peter Topol, Tahoe City, and Michael Slater, Palo Alto, both of Calif., assignors to Safety Intelligence Systems, Reno, Nev.

Filed May 6, 1982, Ser. No. 375,422

Int. Cl.³ G08B *1/08*

U.S. Cl. 340—539 **4 Claims**



1. A fire alarm system comprising:

a plurality of exit sign units, each exit sign unit including a microprocessor and means including a synthesized voice output device coupled to the microprocessor for delivering a plurality of verbal messages to the vicinity of the corresponding exit sign in response to a preselected pattern of activating input signals;

at least one interface processor means, each said interface processor means including means for receiving and responding to a plurality of condition signals from different locations indicating at least the existence or non-existence of alarm conditions, said interface processor means being operative to couple together at least certain of the exit sign units to thereby cause a general alarm to be indicated in the vicinities of said certain exit sign units;

means for communicating condition signals and activating signals between said interface processor means and said exit sign units;

central monitoring means for manually overriding an alarm condition; and

means for communicating among said interface processor means.

4,531,115

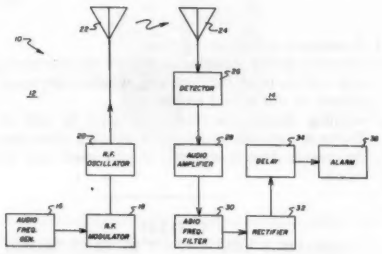
REMOTE ALARM SYSTEM

Donald Black, Indianapolis, and James D. Pirtle, Lawrence, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Jul. 26, 1982, Ser. No. 402,154

Int. Cl.³ G08B *1/08*

U.S. Cl. 340—539 **8 Claims**



1. A remote alarm system, comprising:

a transmitter;

circuit means, included in said transmitter for generating an audio frequency electrical signal;

means for activating said circuit means for generating;

modulator circuit means, included in said transmitter and coupled to said circuit means for generating, for forming a current source modulated by said circuit means for generating;

radio frequency oscillator circuit means included in said transmitter and coupled to said modulator circuit means for being modulated by said modulated current source;

antenna means coupled to said radio frequency oscillator circuit means for transmitting signals therefrom;

a receiver;

antenna means for receiving transmissions from said antenna means for transmitting;

super-regenerative detector means included in said receiver and coupled to said antenna means for receiving;

amplifier means included in said receiver and coupled to said detector means for amplifying signals therefrom;

notch filter means included in said receiver and coupled to said amplifier means for selectively filtering the audio frequency of said circuit means for generating;

alternating current rectifier means included in said receiver and coupled to said filter means for converting any said audio frequencies filtered by said filter means into a direct current signal;

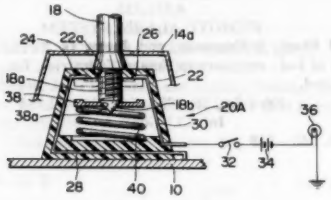
delay circuit means, included in said receiver and coupled to said rectifier means, for delaying activation of an alarm signal until said direct current signal is present for a predetermined amount of time and for determining a period of time for activation of an alarm signal; and

alarm means coupled to said delay circuit means for generating an alarm signal in response to said delay circuit means.

4,531,116
WARNING SYSTEM FOR INDICATING ABSENCE OF EMERGENCY SPARE TIRE FROM A SPARE TIRE CONTAINER

Kazumasa Takagi, and Yasuyuki Yamaguchi, both of Yokohama, Japan, assignors to Nissan Motor Company, Ltd., Japan

Filed Aug. 16, 1982, Ser. No. 408,703
Claims priority, application Japan, Sep. 28, 1981, 56-153146
Int. Cl.³ G08B *21/00, 13/14*
U.S. Cl. 340—568 **18 Claims**

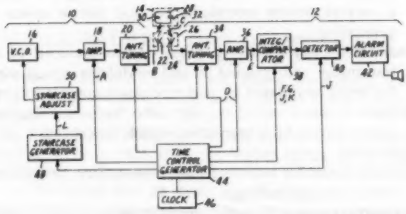


1. A warning system, comprising:
a detecting device mounted in a spare tire containing recess of a vehicle body for detecting whether the spare tires is present or not in said recess; and
a warning device electrically actuated by said detecting device in a manner to provide a warning when said detecting device detects absence of said spare tire from that recess.

4,531,117
VARIABLE FREQUENCY RF ELECTRONIC SURVEILLANCE SYSTEM

Gary E. Nourse, Osceola, Wis., and Dean M. Dowdle, White Bear Lake, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 5, 1983, Ser. No. 510,954
Int. Cl.³ G08B *13/24*
U.S. Cl. 340—572 **44 Claims**

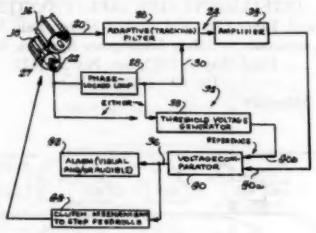


1. An electronic article surveillance system including
(a) transmitter means for creating within an interrogation zone, bursts of electromagnetic energy at discretely different radio frequencies within a predetermined range of frequencies, each burst being spatially separated from the next by a quiescent period during which the transmitter means does not transmit,
(b) receiver means for receiving electromagnetic signals at said radio frequencies during said quiescent periods and for activating alarm means when said received signals exceed a predetermined level, and
(c) marker means adapted to be affixed to an article, the presence of which within said interrogation zone is to be monitored, said marker means comprising an inductive-capacitive (LC) circuit resonant at a frequency within said range of frequencies such that when said marker means is in said interrogation zone RF transmitted energy is absorbed by said circuit and is reemitted at said resonant frequency during the subsequent quiescent period for receipt by the receiver means,
wherein in the improvement, said system comprises a plurality of marker means, each adapted to be affixed to an article and each comprising a said LC circuit including an inductive-capacitive-resistive combination designed to have a Q-factor of not less than 50, a nominal resonant frequency f, and an associated bandwidth (BW) centered about said resonant frequency f, all as defined by the expression Q=f/BW, said transmitter means comprises means for creating within said interrogation zone bursts of a sufficient number of different RF frequencies, such that there are bursts of at least three different frequencies sufficiently close to the resonant frequency of each of said LC circuits so as to fall within the bandwidth BW thereof, and said receiver means comprises means at least responsive to frequencies extending through the bandwidth BW of all said LC circuits for activating said alarm means when signals exceeding said predetermined level and corresponding to at least three frequencies are detected.

4,531,118
METAL DETECTOR

David M. Beams, Virden, Ill., assignor to Dickey-john Corporation, Auburn, Ill.

Filed Aug. 29, 1983, Ser. No. 527,211
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—684 **22 Claims**



1. A monitoring circuit for metal detector including a metal sensor for producing a sensor signal in response to the passage of a metallic object through a rotating apparatus and a tachometer for producing a tachometer signal at a frequency proportional to the rate of rotation of said rotating apparatus, said monitoring circuit comprising: adjustable bandpass filtering means responsive to said sensor signal and to a predetermined control signal for controllably varying the pass band center frequency thereof in a predetermined fashion to produce a filtered signal; and control circuit means responsive to said tachometer signal for producing said predetermined control signal.

4,531,119
METHOD AND APPARATUS FOR KEY-INPUTTING KANJI

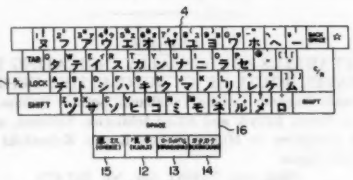
Takeshi Nakayama, Tokyo; Masaaki Kurosu, Chofu; Yoshimitsu Ohshima; Kenji Fujikata, both of Tokyo; Shigeru Uchida, Hitachi, and Akira Nakajima, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 384,600, Jun. 3, 1982, abandoned. This application Nov. 30, 1984, Ser. No. 676,597
Claims priority, application Japan, Jun. 5, 1981, 56-85721
Int. Cl.³ G06F *15/38*
U.S. Cl. 340—712 **27 Claims**

1. A method of key-inputting a first character by operating keys for a second character comprising:

(a) a first step of keying through a keyboard for the second characters a reading of the first character to be entered;

(b) a second step of displaying candidate first characters having said keyed reading in blocks displayed on the screen of a display device, said blocks only being located substantially in correspondence to keys located in home positions of the keyboard and in the neighborhood of said home positions; and



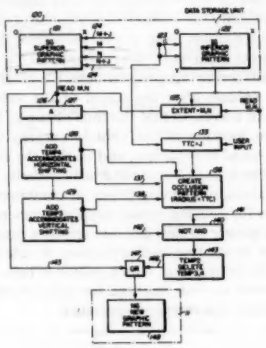
(c) a third step of operating one of said keys located in a home position or in the neighborhood of said home positions on said keyboard corresponding to said first character to be entered out of said candidate first characters displayed in said second step to choose said first character to be entered.

4,531,120

SUPERPOSING GRAPHIC PATTERNS

Kendrick C. Brownell, Jr., and Thomas W. Scrutchin, Jr., both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 20, 1983, Ser. No. 459,430
Int. Cl.³ G09G 1/16
U.S. Cl. 340—723 **7 Claims**



1. The machine-implemented method of superposing a recessive graphic-generating pattern on a dominant graphic-generating pattern, representing each of said graphics as an array of foreground digital signals arranged to correspond to a dot raster pattern configured as the respective graphic patterns;

including the machine-executing steps of:

electrically indicating a graphics separation dimension as an integral number of said dots;

generating an array of digital signals from said dominant graphic array by adding said integral number of said digital signal positions, the dominant graphic array at each dot position of the periphery thereof creating an occlusion array such that said occlusion array appears as an enlarged dominant graphic pattern array;

logically NOT-ANDING said recessive graphic array of foreground digital signals into said occlusion array of foreground digital signals for producing a fragmented array from said recessive graphic array, such that the fragment array only has foreground digital signals not coinciding with occlusion array foreground digital signals; and

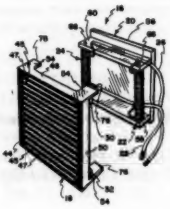
logically ORing said dominant array with said fragmented array for producing a superposed graphic-generating pattern as an array of digital signals suitable for a raster pattern graphics presentation device to present a superposed graphic.

4,531,121

ELECTROMECHANICAL DISCRETE ELEMENT AND A LARGE SIGN OR DISPLAY

Brent W. Brown, Smithfield, Utah, assignor to Integrated Systems Engineering, Inc., Logan, Utah

Filed Oct. 29, 1982, Ser. No. 437,602
Int. Cl.³ G09G 3/34
U.S. Cl. 340—764 **7 Claims**



1. A compact ambient light lampless visual display discrete element having a display area comprising:

a first member comprising a generally flat display face exhibiting alternate similarly dimensioned parallel bands of two contrasting colors, the display face being disposed in a first plane and being reciprocable relative to a second member;

said second member comprising a thin slotted colored band reflecting plate comprising alternate similarly dimensioned parallel open slots and elongated display face masking bars, the plate being disposed in a second plane immediately juxtaposed and essentially parallel to the first plane, the slots and bars extending in parallel, though alternate relationship, each slot and bar being sized, shaped and located so that the display face bands of one color are collectively forwardly exposed at the slots while the display face of the second color are collectively rearwardly concealed by the bars, at any point in time;

the bars comprising exposed forwardly divergently tapered transversely elongated reflective surfaces juxtaposed and extending forward from each slot whereby a portion of ambient light striking the exposed bands displaying one color is first reflected from the bands and thereafter again reflected from the divergently tapered transversely elongated reflective surfaces adjacent each slot such that the apparent width of each exposed band comprising one color is substantially increased and the entire display area of the discrete element appears to the eye of an observer to be essentially of one homogenuous color, without material interruption;

support means which carry the first and second members in said relative reciprocable relationship and in said juxtaposed planes;

single pulse responsive actuator means carried by the support means for relatively rectilinearly reciprocating the display face and the reflective plate between two positions through a distance essentially equal to the width of one band, the actuator means being immediately juxtaposed the rear of the display face and in essentially parallel relationship thereto;

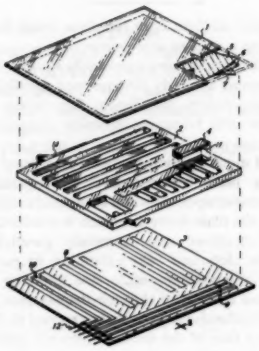
the actuator means comprising electromechanical means, comprising core means and coil means surrounding the core means, and first and second permanent magnet means, the polarity of the core means being reversed by an appropriate current pulse through the surrounding coil means, the first and second permanent magnet means being in alignment with the core means, one permanent magnet means being juxtaposed one end of the core means, and the other permanent magnet means being juxtaposed the other end of the core means, there being a cumulative gap between the core means and the two permanent magnet means essentially equal to the width of one said color band, one of the electromagnetic means or the two permanent magnet means being electromagnetically rectilinearly reciprocated by the pulse-created change in polarity, the pole orientation of the first and second permanent magnet means magnetically causing the core means to shift from contiguous engagement with one permanent magnet means to the other upon each pulse created change in polarity to thereby rectilinearly reciprocate the reciprocable member, and the other of the electromagnetic means and two permanent magnet means being held in a stationary position by the support means.

4,531,122

FLATSCREEN

Lawrence J. Redfield, 9401 Forest View Rd., Evanston, Ill. 60203

Filed Jul. 14, 1982, Ser. No. 398,258
Int. Cl.³ G09G *1/00*
U.S. Cl. 340—781 **7 Claims**



1. A video display device comprising an evacuated panel including, successively, a transparent cover, a cathodoluminescent screen producing radiation inward and outward, a non-conductive separator, and a non-conductive substrate with photoemissive elements disposed onto the inner surface thereof, an electron flow being produced between said screen and said elements by optical feedback, means for producing a DC potential between said screen and said elements to accelerate the electrons in said flow, further comprising;

means to modulate, from an external video signal, said DC potential to generate an image upon said screen, and:

said photoemissive elements arrayed so as to form:

(a) parallel address leads of one axis of an x-y matrix;

(b) active elements of an integral shift register to address the complimentary axis of said matrix, said active elements connected alternately to three or more scan lines actuated externally be a sequential control means, and divided into cells by said separator, with transfer means in said separator to transfer light between adjoining cells, so that a light packet produced by a starter means at one end of said register will be advanced along said cells as said scan lines are actuated, thereby producing optical address signals to said x-y matrix, said signals directed thru channels in said separator orthogonal to said address leads;

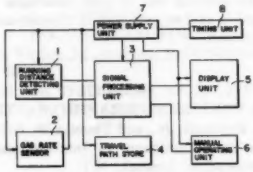
(c) active elements of an additional integral shift register to address said parallel leads, said additional register optically coupling said parallel leads with an input means consisting of a support, and a photocathode upon said support aligned so as to be in proximity to said additional register and said parallel leads.

4,531,123

APPARATUS FOR VISUALLY INDICATING THE TRAVEL ROUTE OF AN AUTOMOTIVE VEHICLE

Katsutoshi Tagami; Tsuneo Takahashi, both of Saitama; Shinichiro Yasui, Tokyo, and Akira Ichikawa, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1982, Ser. No. 385,671
Claims priority, application Japan, Jun. 5, 1981, 56-87157
Int. Cl.³ G08G *1/12*
U.S. Cl. 340—995 **2 Claims**



1. A travel route indicating apparatus for use in an automotive vehicle, wherein a current travel route of the automotive vehicle in terms of two-dimensional coordinates may be obtained arithmetically for a unit travel distance of the vehicle on the basis of the outputs from a travel distance detecting unit adapted to detect a current travel distance of the vehicle, and from a gas rate sensor adapted to detect a resultant azimuth taken by the vehicle after the travel of the vehicle up to a current point of travel, so that the thus-obtained location data on the current location of the vehicle varying from time to time may be stored in sequence, and so that the current travel path of the vehicle may be continuously visually indicated as the vehicle travels, which comprises, in combination:

timer means for causing power supply means to initiate the supply of power to said gas rate sensor a preset period of time prior to starting said apparatus, as selectively set in advance by an operator, which period of time corresponds to the period to time required for said gas rate sensor to reach a stable operating temperature.

4,531,124

DEVICE FOR PROCESSING LOGARITHMIC SIGNALS, AND ITS APPLICATION TO A FREQUENCY DIVERSITY RADAR

Jean L. Lassallette; Guy Lepère, and Gérard Rotat, all of Paris, France, assignors to Thomson CSF, Paris, France

Filed Dec. 4, 1981, Ser. No. 327,713
Claims priority, application France, Dec. 5, 1980, 80 25909
Int. Cl.³ G01S *13/16*; G06F *7/566*
U.S. Cl. 343—5 DP **8 Claims**

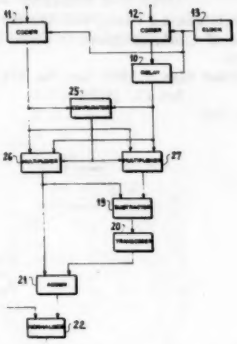
1. In a frequency diversity radar a device for the digital processing of logarithmic signals which upon receiving at least two signals r1 and r2 in their logarithmic form, delivers a logarithmic signal of the sum of said signals under the logarithm symbol, Log (r1+r2), comprising:

a first coder adapted for connection to a first logarithmic signal receiver for delivering signal Log r1;

a second coder adapted for connection to a second logarithmic signal receiver for delivering signal Log r2;

a subtraction circuit receiving the outputs of said first and second coders respectively and delivering the logarithm of the ratio of said signals r1 and r2;

a transcoding circuit connected to said subtraction circuit for delivering signal Log (1+(r1/r2)); and



an addition circuit having two inputs, the first one connected to said transcoding circuit and the second one to the coder of which the signal has been subtracted in said subtraction circuit, the output of said addition circuit being said logarithmic signal.

4,531,125

THREE-DIMENSIONAL AIR SPACE SURVEILLANCE RADAR

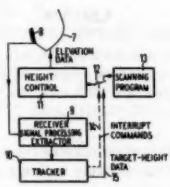
Guenter Beyer, Gilching; Rudolf Hauptmann, Dachau, and Rainer Peters, Unterhaching, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 28, 1982, Ser. No. 392,749

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1981, 3129492

Int. Cl.³ G01S *13/72*

U.S. Cl. 343—7.9 **4 Claims**



1. A three-dimensional air space surveillance radar with a target tracking means which is connected to a radar data signal processing means with target parameter extraction and in which all measured target data, namely, range, azimuth and elevation are stored and those data are extrapolated for targets for which a trace has already been formed, and comprising, a panorama antenna which rotates around a vertical axis and which illuminates the air space to be monitored over its entire elevation range to be covered with a broad elevation coverage beam during each antenna revolution and which has a pencil-shaped reception lobe which is electronically and/or mechanically controlled in elevation and is mechanically controlled in the azimuth level due to the rotational movement, the improvement comprising, the elevation angle (θ_E) of the pencil-shaped reception lobe (1) is controlled by altitude control means (11), such that during a normally sequencing scanning program that it remains constant during an antenna revolution and moves to a new elevation at the beginning of the next antenna revolution so that a line-shaped air space scanning results further including an electronic switch (12) for the brief interruption of the normally sequencing scanning program (13) and said electronic switch (12) for brief interruption is closed during such time ranges in which, on the basis of the target data determined by the target tracking means (10) where known target echoes occur from an elevation angle which differs from the current elevation angle during the normal scanning program and during such an interrupt, the target altitude data determined by the target tracking means (10) are supplied to said altitude control means (11) for altitude control so that the reception lobe elevation angle of the respectively expected target echo is switched on during said interrupt.

4,531,126

METHOD AND DEVICE FOR ANALYZING A VERY HIGH FREQUENCY RADIATION BEAM OF ELECTROMAGNETIC WAVES

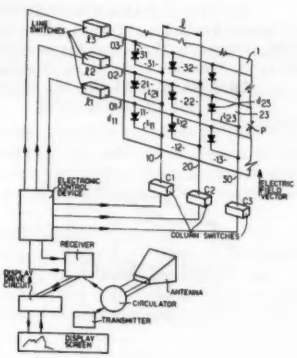
Henri Sadones, Paris, France, assignor to Societe d'Etude du Radant, Les Ulis Cedex, France

Filed May 17, 1982, Ser. No. 379,194

Claims priority, application France, May 18, 1981, 81 09855

Int. Cl.³ G01S *7/40*

U.S. Cl. 343—17.7 **7 Claims**



1. In an antenna beam analyzing system, a selectively reflective structure positioned in confronting relation to an antenna and comprising:

a first plurality of coplanar conductors disposed in parallel spaced relation;

a second plurality of coplanar conductors disposed in parallel spaced relation to each other and respectively orthogonal to the first conductor plurality so that the conductors form a matrix configuration having individual contiguous mesh-like units;

means mounting the planes of the first and second conductor pluralities in spaced non-contacting relation;

a diode array including individual diodes uniquely connected between a conductor of the first plurality and a conductor of the second plurality, each diode oriented parallel to the electric field of the antenna beam; and

means for individually switching a small number of adjacent diodes to a first state while switching the remaining diodes to a second state, the switching means further addressing a different small number of diodes during sequential inter-

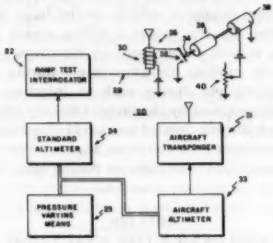
vals in a predetermined pattern causing changing corresponding return signals to the antenna.

4,531,127

TESTER FOR AIRCRAFT ALTITUDE REPORTING SYSTEM

Earl W. Springer, 1713 S. Manhattan Ave., Tampa, Fla. 33629

Filed Apr. 9, 1984, Ser. No. 598,442
Int. Cl.³ G01S 7/40
U.S. Cl. 343—17.7 **10 Claims**



1. In an improved aircraft altitude reporting test system including a ramp tester, an antenna, and means for coupling the ramp tester to the antenna, the improvement comprising

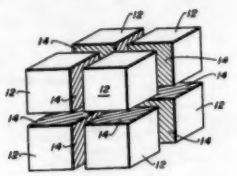
means for interrupting the circuit between the ramp tester and the antenna.

4,531,128

BUOYANT RADAR REFLECTOR

Dean L. Mensa, Ventura, and Dale C. Moss, Vandenberg, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 26, 1982, Ser. No. 401,764
Int. Cl.³ H01Q 15/18
U.S. Cl. 343—18 C **14 Claims**



1. A lightweight, buoyant and omnidirectional radar augmentation device which prevents degradation of cross-section caused by lack of flatness and orthogonality of the reflecting surfaces, comprising:

a. a solid cubical assembly formed from eight individual equal sized cubes of rigid, lightweight, buoyant, radar-transparent material;

b. at least one thin planar layer of highly radar reflective material between each adjoining internal surface of said eight cubes of radar-transparent material forming said solid cubical assembly; said radar reflective material between the adjoining surfaces forming an internal assembly of eight square corner radar reflectors operable to produce a relatively larger radar echo in comparison to its size; said rigid cubes of radar-transparent material preventing warp and distortion of the flat radar reflective material surfaces while maintaining the internal corner radar reflector surfaces flat and orthogonal;

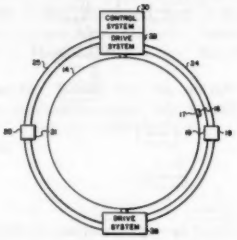
c. means for retaining said eight individual cubes of radar-transparent material and said thin planar layers of highly radar reflective material together in said solid cubical assembly; each side of said cubical assembly being twice the length of a single one of said eight cubes of radar-transparent material.

4,531,129

MULTIPLE-FEED LUNEBERG LENS SCANNING ANTENNA SYSTEM

Mark E. Bonebright, La Mesa, and Everett C. Mehner, San Diego, both of Calif., assignors to Cubic Corporation, San Diego, Calif.

Filed Mar. 1, 1983, Ser. No. 471,047
Int. Cl.³ H01Q 19/06
U.S. Cl. 343—754 **8 Claims**



1. A multiple-feed Luneberg lens scanning antenna system comprising

a Luneberg lens disposed for rotation; first antenna feed means connected to and defining a first feed point on the surface of the lens;

a plurality of second antenna feed means respectively connected to and defining a plurality of second feed points outside and closely adjacent the periphery of the lens;

support means for separately supporting each of the second feed means at positions independent of each other and of the rotation of the lens;

drive means coupled to the support means for separately positioning each of the second feed means and coupled to the lens for rotating the lens to cause the first feed point to scan over a wide angle; and

control means coupled to the first feed means for receiving and processing singals received in response to the first feed point scanning over said wide angle and coupled to the drive means for causing the drive means to separately position each of said second feeds in response to said processed signals to continuously track a respective plurality of targets of interest.

4,531,130

CROSSED TEE-FED SLOT ANTENNA

Richard L. Powers, and Kenneth D. Arkind, both of Nashua, N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Jun. 15, 1983, Ser. No. 504,567
Int. Cl.³ H01Q 1/38, 13/18
U.S. Cl. 343—767 **21 Claims**

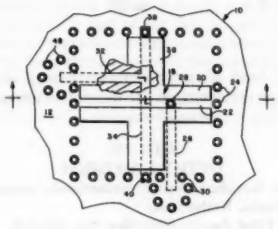
1. A variable-polarization microwave antenna for reception and transmission of microwaves within a predetermined range of frequencies, said antenna comprising:

A. first and second generally planar ground-plane conductors spaced apart and extending generally parallel to each other, said first conductor forming a generally cruciform aperture having first and second arms extending transversely of each other;

B. shorting elements extending between said ground-plane conductors to short them together and surrounding said aperture to form a cavity defined by said ground-plane conductors and said shorting elements, the distances across said cavity in the directions of said aperture arms

being between one-half and one wavelength at frequencies within the predetermined frequency range;

C. a first feed line including a first generally tee-shaped feed conductor whose stem extends between and generally parallel to said ground-plane conductors and into said cavity out of registration with said second aperture arm, the crosspiece of said first feed conductor being disposed in said cavity in registration with said first aperture arm and shorted to said ground planes at its ends; and



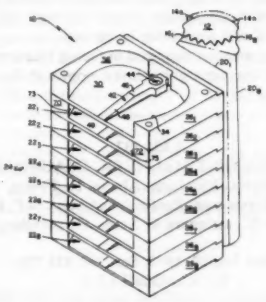
D. a second feed line including a second generally tee-shaped feed conductor whose stem extends between and generally parallel to said ground-plane conductors and into said cavity out of registration with said first aperture arm, the crosspiece of said second feed conductor being disposed in said cavity in registration with said second aperture arm and shorted to said ground planes at its ends, said first and second feed lines being independently driveable for variation of the plane of polarization by variation of the amplitude ratio of the drive signals on said first and second feed lines.

4,531,131

RIDGED WAVEGUIDE ANTENNA WITH CONCAVE-SHAPED SIDEWALLS

George J. Monser, Goleta, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Dec. 10, 1982, Ser. No. 448,877
Int. Cl.³ H01Q *13/02*
U.S. Cl. 343—786 **4 Claims**



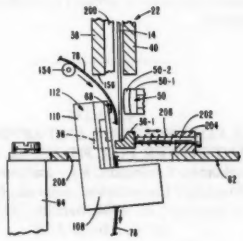
1. A radio frequency antenna element, comprising: a rectangular waveguide structure with concave-shaped narrow side walls extending from a rear wall of the waveguide structure to an aperture of the antenna element, such narrow side walls having a separation therebetween which progressively increases as the sidewalls extend from the rear wall to a point spaced from the aperture then progressively decreases as the side walls extend from such point to the aperture; a ridge-shaped feed structure disposed between and spaced from such narrow side walls extending from the rear wall to the aperture; and, a pair of ground plane conductors, each one thereof having surfaces with an edge terminating along an aperture forming edge of a corresponding one of the side walls at the periphery of the aperture to provide a pair of narrow aperture edges.

4,531,132

METHOD AND APPARATUS FOR THERMALLY PRINTING DATA IN SPECIAL FONTS ON DOCUMENTS LIKE CHECKS

Philip J. Wilkinson, Nepean, Canada, assignor to NCR Corporation, Dayton, Ohio

Filed Oct. 27, 1983, Ser. No. 546,131
Int. Cl.³ B41J *3/20*
U.S. Cl. 346—76 PH **10 Claims**



2. A thermal printing apparatus comprising:

a print station;

means for positioning a record medium at said print station;

means for printing on a said record medium positioned at said print station;

said means for printing comprising:

an arcuately-shaped platen positioned at said print station;

a line of printing elements;

means for selectively energizing said line of printing elements; and

means for providing relative movement between said line of printing elements and said platen from a substantially common center point so as to maintain said line of printing elements in substantial tangential relationship with said platen;

said providing means comprising:

first lever means for supporting said line of printing elements with regard to said common center point; and

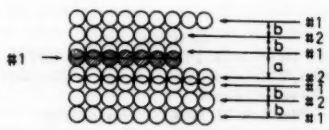
said lever means cooperating with said first lever means to pivot said line of printing elements to provide said relative movement.

4,531,133

THERMAL RECORDING DEVICE

Svay Leng, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Kanagawa, Japan

Filed Nov. 25, 1983, Ser. No. 555,215
Claims priority, application Japan, Feb. 2, 1983, 58-14622
Int. Cl.³ B41J *3/20*
U.S. Cl. 346—76 PH **9 Claims**



1. A thermal recording device for recording on a thermal recording medium in response to recording data signals, the device comprising:

a thermal recording head and a back roll being disposed

opposite to each other so as to sandwich a thermal recording medium therebetween wherein one line each of recording is effected after movement of said recording medium;

a timer for measuring an interval after recording of a certain one line was completed to produce an output at a time when an expected period of time elapses;

means for resetting said timer in response to an input of a recording data signal; and

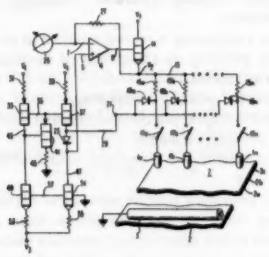
means for supplying a same data signal with that used in recording the certain one line effected immediately before a present recording to said thermal recording head in response to the output of said time, thereby to effect again a same printing with that of the certain one line recorded immediately before the present recording on said recording medium.

4,531,134

REGULATED VOLTAGE AND APPROXIMATE CONSTANT POWER FOR THERMAL PRINTHEAD

Frank J. Horlander, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 26, 1984, Ser. No. 593,052
Int. Cl.³ B41J *3/20*
U.S. Cl. 346—76 PH **28 Claims**



1. Circuitry to provide drive current to a plurality of electrodes suitable for printing comprising:

a separate electrical connection to a first point from each of said electrodes, each said connection being such that the voltage at said first point varies essentially as a function of the potential of said electrodes, each said connection being an electrical path in parallel with drive current through said electrodes,

a differential voltage amplifier having a control input which varies essentially as a function of the potential of said first point and an output, and

means connecting said output of said amplifier to said electrodes to provide drive current to said electrodes in proportion to the output voltage of said amplifier.

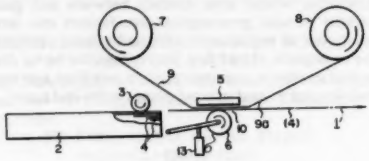
4,531,135

THERMAL TRANSFER TYPE PRINTING APPARATUS

Akira Toshima, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 22, 1984, Ser. No. 623,566
Claims priority, application Japan, Jun. 30, 1983, 58-117050
Int. Cl.³ B41J *3/10*
U.S. Cl. 346—76 PH **11 Claims**

7. A thermal transfer printing method comprising a tranferring process for transferring the ink layer of the thermal transfer ink ribbon to a to-be-printed matter by a thermal head, and an erasing process for transporting again the ink ribbon into



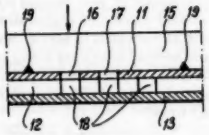
said thermal head after transferring thereby rendering the negative image remaining on the ink ribbon unreadable.

4,531,136

OPTICAL MEDIUM

Joseph M. E. Beaujean, Venlo, Netherlands, assignor to Docdata BV, Venlo, Netherlands

Filed Jun. 2, 1983, Ser. No. 500,339
Claims priority, application Netherlands, Jun. 2, 1982, 8202229
Int. Cl.³ G01D *15/34*; B32B *15/08*; G03C *5/04*
U.S. Cl. 346—135.1 **18 Claims**



1. A medium for recording optically readable information, comprising:

a. an optically sensitive layer of material having first and second opposing faces;

b. a transparent layer disposed adjacent and secured to said first face;

c. a separating layer disposed adjacent and secured to said second face, said separating layer configured to define a plurality of holes which extend through the complete thickness of said separating layer; and

d. a reflective member disposed in facing relationship to the surface of the separating layer opposite the recording layer.

4,531,137

THERMOREMANENT MAGNETIC IMAGING METHOD

Reinhold E. Drews, Pittsford; Almon P. Fisher, Rochester; Herman A. Hermanson, Penfield, and Stephen F. Pond, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 20, 1983, Ser. No. 515,720
Int. Cl.³ G01D *12/15*
U.S. Cl. 346—74.4 **8 Claims**

3. A thermoremanent magnetic imaging station for use in a magnetographic printing machine to produce latent magnetic images on a magnetizable surface of a moving recording medium for subsequent development and transfer to a permanent copy substrate, the magnetic imaging station comprising:

a thermal printhead having a plurality of thermal heating elements which are individually heated by the application of a voltage of predetermined duration in accordance with data signals supplied thereto;

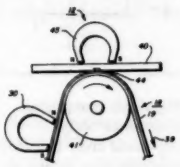
a pressure applying roller which forms a nip with the thermal printhead, the recording medium being sandwiched between the thermal printhead and the pressure roller, so

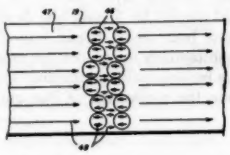
that the magnetizable surface of the recording medium is in pressure contact with the heating elements of the thermal printhead as the recording medium moves therethrough;

a first magnetizing source positioned upstream from the nip to apply a pre-magnetization to the entire magnetizable surface of the recording medium prior to entry by the recording medium into said nip, the first magnetizing source having a polarity which orients the magnetic poles in the pre-magnetized surface all in one direction;

a second magnetizing source positioned at said nip, the second source having a field strength lower than and a polarity opposite to that of the first magnetizing source, the position of said second magnetizing source providing a magnetic field through which the recording medium passes as it moves through the nip;

each heating element being adapted upon the application of a voltage thereto in response to said data signals to heat





serially a plurality of small areas of the pre-magnetized surface of the recording medium above the Curie point temperature for said surface, consecutive applications of voltage to each heating element for heating succeeding adjacent small areas being separated by a predetermined time interval, so that the individually heated small areas are separated from each other and surrounded by said premagnetization; and

the movement of the recording medium surface through the nip being adjusted to allow the small heated areas to cool while still in the magnetizing field of said second magnetizing source so that the magnetic poles in the small areas have been switched and frozen therein, producing fringe fields between the small areas and the pre-magnetized areas, which fringe fields represent the latent magnetic images that upon development thereof with toner will provide a high quality development image with adequate toner density.

4,531,138

LIQUID JET RECORDING METHOD AND APPARATUS

Ichiro Endo, Yokohama; Shigetaro Ogura, Musashino, and Shigeru Ohno, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 304,930, Sep. 23, 1981, abandoned. This application Dec. 16, 1983, Ser. No. 562,994

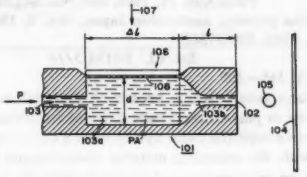
Claims priority, application Japan, Oct. 2, 1980, 55-138009

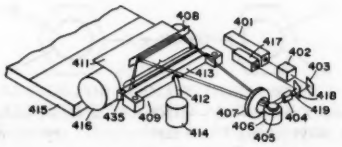
Int. Cl.³ G01D *15/18, 15/10*

U.S. Cl. 346—140 R **13 Claims**

1. A liquid jet recording method comprising the steps of:

(a) irradiating with a light beam an opto-mechanical transducing means mechanically coupled to a pressure acting zone of a liquid flow path to transmit a pressure generated by the irradiation of said light beam to liquid in said pressure acting zone, said liquid flow path having a discharge orifice to form a droplet flying in a predetermined direction by ejection of the liquid, when the pressure generated from said opto-mechanical transducer means acts on the liquid in said pressure acting zone;





(b) displacing a wall of said pressure acting zone by a mechanical displacement of said opto-mechanical transducing means caused by said light beam irradiation;

(c) causing an abrupt pressure change to occur in the liquid in said pressure acting zone; and

(d) ejecting the liquid from said liquid discharge orifice to form the flying droplet which is directed towards a recording medium to adhere thereon for recording.

4,531,139

COLOR DEVELOPERS FOR PRESSURE-SENSITIVE OR HEAT-SENSITIVE RECORDING PAPERS

Michael E. A. Seitz, Dayton, Ohio, assignor to The Standard Register Company, Dayton, Ohio

Filed Oct. 21, 1983, Ser. No. 544,422

Int. Cl.³ B41M *5/16, 5/18, 5/22*

U.S. Cl. 346—201 **10 Claims**

6. In the method of producing a colored marking by causing a dye precursor to come into contact with a color developer, the improvement wherein said color developer is a compound including a sulfonylamide (—SO_2NH—) group and also including an electron-withdrawing atom or moiety within five atoms of the nitrogen atom of said sulfonylamide group, said compound being free of any basic group, with any additional NH groups being no more than one carbon atom away from an SO_2, C═O, C═N or NO_2 group, with the proviso that the electron withdrawing group is not a carboxyphenyl group connected through the nitrogen atom of the sulfonylamide group, with the further proviso that the sole electron-withdrawing group is not a carboxyphenyl group and with the further proviso that said compound does not include a hydroxy group on the opposite side of the amide from the sulfonyl group of the sulfonylamide group.

4,531,140
HEAT-SENSITIVE RECORDING MATERIAL

Toshitake Suzuki, Hyogo; Naoto Arai, Osaka; Shoji Aoyagi, Hyogo; Toranosuke Saito, Osaka; Masakatu Kitani, Hyogo, and Takashi Ishibashi, Osaka, all of Japan, assignors to Kansaki Paper Manufacturing Co. Ltd., Tokyo and Sanko Kaihatsu Kagaku Kenkyusho Corporation, Osaka, both of, Japan

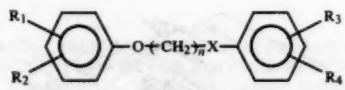
Filed Aug. 21, 1984, Ser. No. 642,816

Claims priority, application Japan, Sep. 8, 1983, 58-166011; Jul. 2, 1984, 59-137565

Int. Cl.³ B41M 5/18

U.S. Cl. 346—209 5 Claims

1. In a heat-sensitive recording material incorporating a colorless or pale-colored basic dye and a color acceptor which is reactive with the basic dye to form a color when contacted therewith, the recording material characterized in that at least one compound represented by the formula [I] is contained in a heat-sensitive recording layer



[I]

wherein X is —O— or —COO—, R_1 to R_4 are each hydrogen atom, alkyl having 1 to 8 carbon atoms, aryl having 6 to 10 carbon atoms, aralkyl having 7 to 9 carbon atoms, chlorine atom, acetyl, propionyl, methoxy, methylthio, methoxycarbonyl, cyano, nitro or cyclohexenyl, substituents R_1 and/or R_2 or substituents R_3 and R_4 may link together to form aromatic ring(s), n is an integer of 1 to 10.

4,531,141
HEAT-SENSITIVE COMPOSITION AND IMAGING SHEET INCORPORATING SAME

Burt K. Sagawa, Bloomington, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 17, 1983, Ser. No. 458,323

Int. Cl.³ B41M 5/18

U.S. Cl. 346—209 8 Claims

1. A heat-sensitive sheet material comprising

(a) a substrate,

(b) a heat-sensitive layer bonded to said substrate, said layer comprising (1) at least two reactants which at normal room temperature do not react with each other, but which, upon application of thermal energy, undergo a chemical reaction with each other which results in change of color, said at least two reactants being selected from the group of reactants consisting of (a) a ferric salt of an organic acid and a phenolic compound which forms a complex with the ferric ion of said ferric salt upon application of thermal energy and (b) a uniformly dispersed mixture of at least one zinc salt selected from the class consisting of zinc lower alkyl di-substituted di-thiocarbamates, the substituted radicals of which have from one to five carbon atoms, and zinc aryl di-substituted di-thiocarbamates, and at least one heavy metal salt of a higher fatty acid which is non-reactive with said zinc salt at normal room and storage temperature and is reactive therewith at temperatures above the melting point of said zinc salt to produce a color change, and (2) a non-complexing phenolic compound, said non-complexing phenolic compound having no hydroxyl groups in adjacent positions on any aromatic ring thereof.

4,531,142
LIGHT EMITTING DIODE HAVING SILICON CARBIDE LAYERS

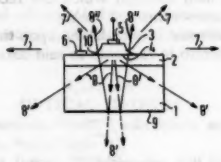
Claus Weyrich, Gauting; Guenther Ziegler, Erlangen; Ludwig Hoffmann, and Dietmar Theis, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 16, 1983, Ser. No. 466,921

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1982, 3208638

Int. Cl.³ H01L 33/00

U.S. Cl. 357—17 7 Claims



1. A light emitting diode comprising:

a silicon carbide substrate body;

an intermediate epitaxial layer consisting of silicon carbide of a first conductivity type grown on said substrate body;

an upper epitaxial layer consisting of silicon carbide of a second conductivity type grown on said first layer;

each of said epitaxial layers having an electrode directly connected thereto for biasing said diode; and

said substrate body being doped such that said substrate body is substantially transparent for radiation generated at a junction between said intermediate layer and said upper layer upon the application of bias current to said electrodes.

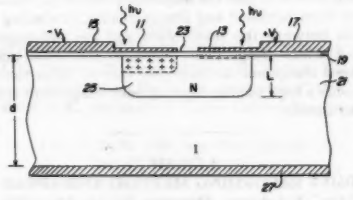
4,531,143
LASER ACTIVATED MTOS MICROWAVE DEVICE

Joseph Maserjian, 5668 Pine Cone Rd., LaCrescenta, Calif. 91214

Filed Oct. 14, 1983, Ser. No. 542,232

Int. Cl.³ H01L 29/78

U.S. Cl. 357—23.6 4 Claims



1. A semiconductor device comprising:

an intrinsic silicon substrate;

a lightly doped region in said silicon substrate;

a dielectric layer formed on said silicon substrate and over said lightly doped region; and

first and second light absorptive, conductive layers, each residing on said dielectric layer and extending over said lightly doped region, said first and second conductive layers being spaced apart by a gap, said gap residing over said lightly doped region.

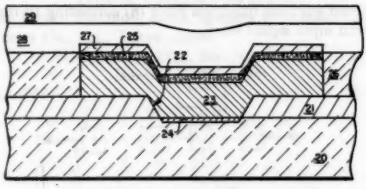
4,531,144
ALUMINUM-REFRACTORY METAL INTERCONNECT WITH ANODIZED PERIPHERY

Scott H. Holmberg, Escondido, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 378,124, May 14, 1982, abandoned, which is a continuation of Ser. No. 106,074, Dec. 20, 1979, abandoned, which is a continuation of Ser. No. 919,277, Jun. 28, 1978, abandoned. This application Feb. 21, 1984, Ser. No. 580,291

Int. Cl.[3] H01H *23/48, 29/46*

U.S. Cl. 357—71 7 Claims



1. An improved planar multilevel electrical interconnect structure for employment with semiconductor devices which are integrated on the surface of a semiconductor substrate; said interconnect structure being of the type which includes a first insulating layer overlying said surface; a first plurality of spaced-apart aluminum connectors to said devices lying on said first insulating layer; a second insulating layer overlying said first plurality of spaced-apart aluminum connectors; a second plurality of connectors to said devices lying on said second insulating layer and crossing over said first plurality of spaced-apart aluminum connectors at various locations with said second insulating layer lying therebetween; wherein the improvement comprises:

a patterned anodized aluminum oxide layer between said first and second insulating layers filling the spaces between and forming a planar structure with said first plurality of spaced-apart aluminum connectors;

a refractory metal selected from the group of tantalum, titanium, tungsten, and hafnium overlying said first plurality of connectors at said locations where said first and second plurality of connectors cross over each other and abutting said patterned anodized aluminum oxide layer; and

the sides of said refractory metal abutting said patterned anodized aluminum oxide layer being anodized and operating as an insoluble barrier to anodizing solutions and the remainder of said refractory metal being unanodized.

4,531,145
METHOD OF FABRICATING COMPLEX MICRO-CIRCUIT BOARDS AND SUBSTRATES AND SUBSTRATE

Raymond E. Wiech, Jr., San Diego, Calif., assignor to Fine Particle Technology Corporation, Camarillo, Calif.

Division of Ser. No. 174,929, Aug. 4, 1980,. This application Sep. 17, 1982, Ser. No. 419,172

Int. Cl.[3] H01L *23/34, 23/12, 23/48*

U.S. Cl. 357—81 4 Claims

1. A ceramic substrate comprising:

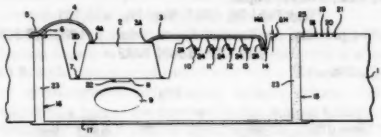
(a) a body of electrically insulating materials having an upper surface and at least one other surface,

(b) a plurality of grooves formed in the upper surface of said body,

(c) continuous electrically conductive material disposed in the bottoms of said grooves and extending upward to a region below the tops of said grooves,

(d) regions on said upper surface for disposing and securing to said upper surface heat emitting devices, and

(e) a continuous aperture heat sink enclosed by and within said body in a plane substantially parallel to said upper



surface and extending to at least one surface of said body and disposed closely adjacent said regions.

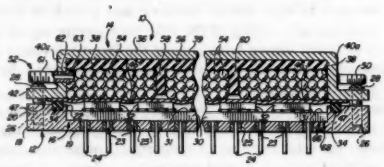
4,531,146
APPARATUS FOR COOLING HIGH-DENSITY INTEGRATED CIRCUIT PACKAGES

John M. Cutchaw, 7333 E. Virginia Ave., Scottsdale, Ariz. 85257

Filed Jul. 14, 1983, Ser. No. 513,618

Int. Cl.[3] H01L *23/46*

U.S. Cl. 357—82 12 Claims



1. An apparatus for cooling a high-density integrated circuit package of the type having a substrate with a plurality of discrete integrated circuits arranged thereon in a predetermined array, said apparatus comprising:

(a) a housing defining an open coolant chamber which is sized so that its opening substantially matches the surface area of the substrate of the integrated circuit package, said housing for positioning in overlying relationship with respect to the integrated circuit package;

(b) a diaphragm of thin-wall pliable heat conductive material with its peripheral edges fixedly attached to said housing so as to sealingly enclose the coolant chamber thereof, said diaphragm having an outwardly facing surface which is in contiguous engagement with each of the discrete integrated circuits of the integrated circuit package when said housing is in overlaying relationship therewith;

(c) said housing having an inlet port and an outlet port by which fluid coolant is passable through the coolant chamber of said housing;

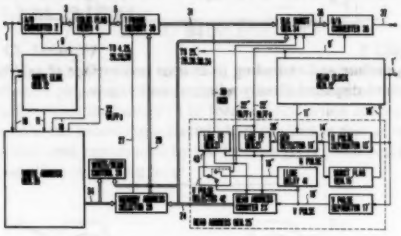
(d) a plurality of spheroids in the coolant chamber of said housing for substantially filling the coolant chamber, each of said spheroids being formed of a metal for conducting heat away from said diaphragm and maximizing the heat exchange surface area into which the fluid coolant comes in contact when passes through the coolant chamber of said housing; and

(e) biasing means in the coolant chamber of said housing and disposed between said housing and said plurality of spheroids for biasing said spheroids into contact with each other and with said diaphragm.

4,531,147
DIGITAL MEMORY COLOR FRAMING CIRCUIT

Toshitake Kouyama, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1983, Ser. No. 470,721
Claims priority, application Japan, Mar. 1, 1982, 57-32053
Int. Cl.³ H04N 9/32
U.S. Cl. 358—13 5 Claims



1. A color framing circuit for a digital memory, comprising:

detection signal generating means for generating, on a write section of said circuit, a first detection signal to indicate which one of four color fields corresponds to a color field at a given horizontal scanning line in a vertical blanking period and for generating, on a read section of said circuit, a second detection signal to indicate a color field synchronous with a reference timing signal, when an input television signal is converted to a digital signal which is then written in said digital memory and which is thereafter read out at a timing of the reference timing signal having a different timing from that of the input television signal;

means for extracting a vertical pulse in response to the reference timing signal;

means for delaying the vertical pulse by a period corresponding to an odd multiple of horizontal scanning lines;

means for selecting one of the vertical pulse and a delayed vertical pulse in accordance with a polarity of the second detection signal;

a toggle flip-flop for loading the first detection signal as loading data read out from said memory using the vertical pulse as a load timing pulse and a horizontal pulse as a clock pulse extracted from the reference timing signal; and

an address counter for receiving an output signal from said toggle flip-flop, the vertical pulse and the horizontal pulse to generate a read address signal.

4,531,148
HIGH SENSITIVITY FM SIGNAL DEMODULATION SYSTEM

Tomozo Ohta; Yoshio Tsutsumi, and Motoshi Sugano, all of Tokyo, Japan, assignors to OKI Electric Industry Co., Ltd., Tokyo, Japan

PCT No. PCT/JP81/00206, § 371 Date Feb. 18, 1983, § 102(e) Date Feb. 18, 1983, PCT Pub. No. WO83/00973, PCT Pub. Date Mar. 17, 1983
PCT Filed Aug. 31, 1981, Ser. No. 474,677
Int. Cl.³ H04N 9/535, 9/50
U.S. Cl. 358—21 R 10 Claims

1. A high sensitivity FM signal demodulation system comprising:

an input terminal (14) for receiving a television FM signal,

a reference bandpass filter (7) having the predetermined bandwidth, coupled with said input terminal (14),

a variable bandpass filter (8) coupled with the output of said reference bandpass filter (7), the center frequency and the bandwidth of said variable bandpass filter being controllable,

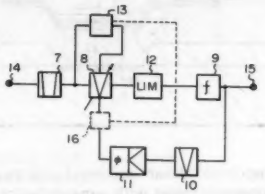
a limiter circuit (12) and a frequency discriminator (9) coupled with the output of said variable bandpass filter,

an output terminal (15) coupled with the output of said frequency discriminator,

a narrow bandwidth bandpass filter (10) for deriving a color sub-carrier component of a picture signal, coupled with the output of said frequency discriminator,

a color sub-carrier adjuster (11) coupled with the output of said frequency discriminator for providing a signal related to the instantaneous frequency of the sub-carrier for controlling the center frequency of said variable bandpass filter (8),

a level detector (13) for measuring the input signal level of said variable bandpass filter (8) to control the bandwidth of said variable bandpass filter (8) according to the measured input signal level,



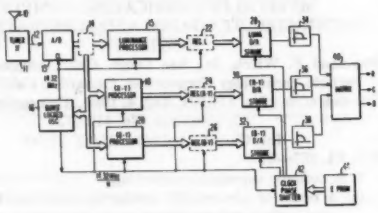
the bandwidth of said variable bandpass filter (8) being controlled to be wide by the output of said level detector (13) when the input level of said television FM signal is higher than a threshold level (C/N) so that the bandwidth of the signal and the noise applied to the limiter circuit (12) and the frequency discriminator (9) is determined by the bandwidth of the reference bandpass filter (7), and said bandwidth of said variable bandpass filter (8) being controlled so as to be narrow as said television FM signal level decreases, and the center frequency of said variable bandpass filter (8) being controlled by the output of said adjuster (11) so that said center frequency follows to the instantaneous frequency of said color sub-carrier component of the input FM signal, and

a signal demodulated by said frequency discriminator (9) being applied to said output terminal (15).

4,531,149
DIGITAL VARIABLE GROUP DELAY EQUALIZER FOR A DIGITAL TELEVISION RECEIVER

Henry G. Lewis, Jr., Hamilton Square, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 24, 1983, Ser. No. 507,458
Int. Cl.³ H04N 5/04
U.S. Cl. 358—31 6 Claims



1. In a video signal processing system including a digital luminance signal processing path and a digital chrominance signal processing path, each of said processing paths operating synchronously with a reference signal and including in cascade arrangement a digital to analog converter and further analog processing circuitry, means for differentially adjusting the

phase of the analog luminance signal with respect to the analog chrominance signal comprising:

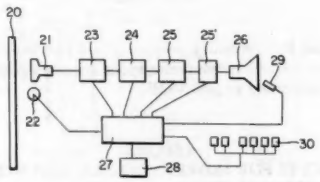
means for generating a clock signal synchronous with said reference signal and having a selectable phase relation therewith; and

means responsive to said selectable phase clock signal for strobing digital signals into at least one of said digital-to-analog converters thereby delaying the analog output signal from said one of said digital-to-analog converters relative to the other.

4,531,150
IMAGE DISPLAY SYSTEM

Tadashi Amano, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 5, 1982, Ser. No. 439,429
Int. Cl.³ H04N *1/46*
U.S. Cl. 358—76 **4 Claims**



1. An image display system comprising:

film scanning means for scanning color images on a film and generating a video signal;

image processing means for transmitting the video signal in accordance with the scanning of the film scanning means;

external information input-output means for feeding a reproduction level control signal into the image processing means to produce an image processed video signal;

an A/D conversion means for converting the image processed video signal from the image processing means into a digital video signal;

image memory means for temporarily memorizing the image processed digital video signal;

display means for displaying a plurality of images memorized in the image memory means;

manually operable means for indicating the position of a principal subject of the images on the display means and generating a signal indicative of said position; and

external memory means for memorizing the signal from the manually operable means.

4,531,151
SYSTEM FOR THE REDUNDANCY-REDUCING DIGITAL TRANSMISSION OF TELEVISION VIDEO SIGNALS

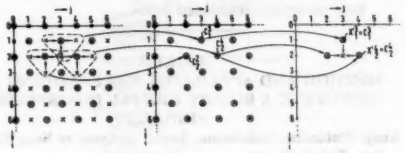
Siegbert Hentschke, Tamm, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 18, 1983, Ser. No. 476,670
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1982, 3211323
Int. Cl.³ H04N *7/13, 9/02*
U.S. Cl. 358—135 **8 Claims**

1. In a system including a transmitter and a receiver, the system providing for communication of pictorial data between the transmitter and the receiver, and wherein the data of a picture is arranged as sample values in a two-dimensional array comprising rows and columns, said communicating being accomplished at reduced bandwidths by transmission of only sample signals corresponding to alternate ones of said sample values in each of successive rows of said array, the improvement wherein:

the transmission of sample signals also corresponds to alternate ones of said sample values in each of successive columns of said array, and wherein each sample signal is formed as a composite of sample values neighboring the corresponding sample value in said array;

said system comprising: a transmit filter including first selecting means at said transmitter responsive to a sequence of sample values read out of said array for selecting a set of predesignated neighboring sample values, and first combining means for combining the sample values of said set to produce a sample signal, said selecting means and



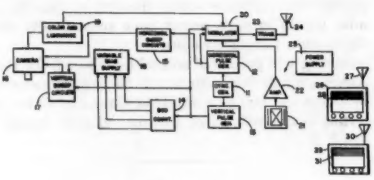
said combining means operating in an interated fashion to produce a succession of sample signals for transmission to said receiver; and

a receive filter including second selecting means at said receiver responsive to a sequence of sample signals received from said transmitter for selecting a set of individual sample signals from a sequence of the sample signals, and second combining means for combining the sample signals of the set of sample signals to produce a corresponding sample value in an array of sample values for reconstruction of said picture at said receiver.

4,531,152
TELEVISION SYSTEM AND METHOD

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840, and Christian Grund, 2035 Burr Ave., Bronx, N.Y. 10461

Continuation-in-part of Ser. No. 81,278, Oct. 3, 1979, abandoned. This application Mar. 24, 1981, Ser. No. 247,090
Int. Cl.³ H04N *5/14*
U.S. Cl. 358—141 **11 Claims**



1. A television system comprising:

first means including a television camera for scanning an image and generating high resolution full frame composite video picture signals wherein each full frame high resolution video picture signal is composed of four successive interlaced fields of said image,

second means for transmitting each of said four successive interlaced scanning fields,

third means including a first video receiver having a high resolution television image display screen and a write beam for generating video images on said display screen and write beam control means for receiving each of said transmitted four successive interlaced scanning fields and for controlling the operation of its write beam in scanning said display screen in four successive interlaced field scannings to define each full frame scanned and to thereby generate a video image at high image resolution,

fourth means including a second video receiver with a display screen with an image resolution which is less than the

resolution of the display screen of said first video receiver and which produces a display defined by frames each containing two successive interlaced scanning fields of the frame on its display screen, and

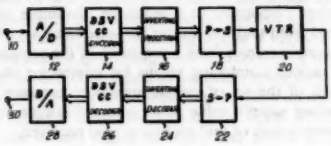
write control means for display screen of said second receiver operable upon receipt of said four successive interlaced scanning fields by said second means for controlling the operation of its write beam to cause the display screen of said second video receiver to display frames of video information having two successive interlaced field scannings and where two successive frames are defined by said four successive interlaced fields.

4,531,153

METHOD AND APPARATUS FOR ENCODING AND DECODING A BINARY DIGITAL INFORMATION SIGNAL

Kenji Watanabe, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 29, 1982, Ser. No. 437,700
Int. Cl.³ H04N *5/16*
U.S. Cl. 358—141 **12 Claims**



1. A method for use with a binary digital signal provided at a source bit rate and formed of a plurality of first n-bit words that correlate in value such that successive words have values close to each other and which have a digital sum variation to produce an encoded binary digital signal having a reduced digital sum variation without increasing the source bit rate, comprising the steps of:

arranging second n-bit words into groups classified by the digital sum variation values thereof, so that the second n-bit words in each group have substantially the same digital sum variation values;

substituting said groups of second n-bit words for groups of corresponding first n-bit words having the same number of words and being arranged in sequential order; and

inverting every m^{th} one of said second n-bit words, where m=2, 3, . . .

4,531,154

INTERFACE FOR A VIDEO DISPLAY PROCESSOR ARRANGED TO PROVIDE AN OVERLAY ON A VIDEO DISPLAY

Gary W. Hallock, Randolph, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

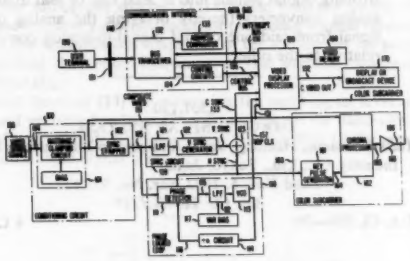
Filed Oct. 29, 1982, Ser. No. 437,879
Int. Cl.³ H04N *5/06*
U.S. Cl. 358—148 **4 Claims**

1. Apparatus for providing an interface between a source of a video signal which includes horizontal and vertical synchronization information and a video display processor (VDP) arranged to generate an overlay for a picture represented by said video signal, including

(a) a means for extracting said synchronization information from a level adjusted version of said video signal,

(b) means including a phase-locked loop responsive to said extracting means for (1) generating a single reconstructed horizontal synchronization pulse during each scan interval determined by said horizontal synchronization information and (2) providing a clock signal to said video display processor which is locked to said horizontal synchronization information,

(c) means including a low-pass filter responsive to said extracting means for recovering said vertical synchronization, and



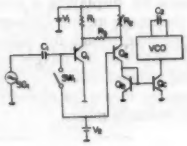
(d) means for combining outputs of said two last mentioned means to form a composite sychronizatin signal adapted for application to said VDP.

4,531,155

CIRCUIT FOR INDEPENDENTLY ADJUSTING FREQUENCY DEVIATION OF A VCO

Kenichi Hasegawa, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Oct. 25, 1982, Ser. No. 436,369
Claims priority, application Japan, Oct. 27, 1981, 56-172314
Int. Cl.³ H04N *1/32*; H04B *1/04*
U.S. Cl. 358—186 **6 Claims**



1. A circuit for controlling a variable frequency oscillator in response to an applied signal source comprising:

a first transistor having a base, emitter and collector with the base connected to receive said signal source through a capacitor,

a first current source connected to the emitter of said first transistor,

a switch for connecting the base of said first transistor to a voltage source,

a second transistor having a base, emitter and collector with the base connected to said voltage source,

a second current source connected to the emitter of said second transistor,

a resistor connecting the emitter of said first transistor with the emitter of said second transistor, and

a variable frequency oscillator responsive to collector current of said second transistor.

4,531,156

SOLID STATE IMAGE PICKUP DEVICE

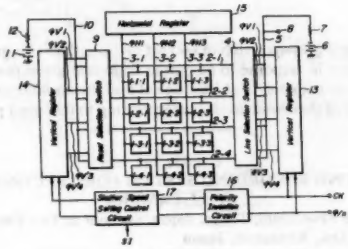
Jun-ichi Nishizawa, No. 6-16, 1-Chome, Komegafukuro, Sendai City, Miyagi Pref., Japan; Sohbe Suzuki; Takashige Tamamushi, both of Sendai, and Yasuo Arisawa, Matsumoto, all of Japan, assignors to Olympus Optical Company Limited and Jun-ichi Nishizawa, both of, Japan

Filed Dec. 1, 1983, Ser. No. 556,993

Claims priority, application Japan, Dec. 14, 1982, 57-217752

Int. Cl.³ H04N *3/11*

U.S. Cl. 358—213 **10 Claims**



1. A solid state image pickup device comprising a plurality of picture cells each having a static induction transistor and arranged in a matrix, means for scanning the picture cells in the horizontal and vertical directions, means for generating scanning pulses which drive the vertical and horizontal scanning means, means for reading out light signal stored in the picture cells, means for resetting the picture cells, first means connected to one end of the vertical scanning means for optionally and selectively connecting the vertical scanning means to the vertical scanning pulse generating means, second means connected to the other end of the vertical scanning means for optionally and selectively connecting the vertical scanning means to the cell reset means, means for generating reset scanning pulses which drive the second means, and means connected to the reset scanning pulse generating means for optionally setting in one frame period the timing of reset scanning pulses generated from the reset scanning pulse generating means.

4,531,157

METHOD AND APPARATUS FOR AUTOMATIC FOCUSING IN VIDEO CAMERA

Katsuji Ishikawa, Higashiosaka, Japan, assignor to West Electric Co., Ltd., Osaka, Japan

Filed Apr. 25, 1983, Ser. No. 488,162

Claims priority, application Japan, Apr. 28, 1982, 57-71809

Int. Cl.³ H04N *5/26*

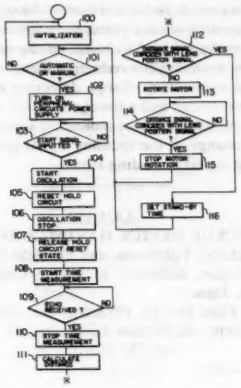
U.S. Cl. 358—227 **6 Claims**

1. A method of automatic focusing in a video camera or the like which is designed for reproducing continuously a state or behavior of an object, comprising the steps of:

measuring a distance to said object;

detecting and recognizing whether or not said object is in motion; and

controlling an interval of performing said distance measuring step in accordance with an output signal obtained in said detecting and recognizing step so that said interval is made longer when said output signal indicates that said object is



not in motion but is stationary than the interval when said object is in motion.

4,531,158

AUTOMATIC FOCUSING SYSTEM FOR VIDEO CAMERAS

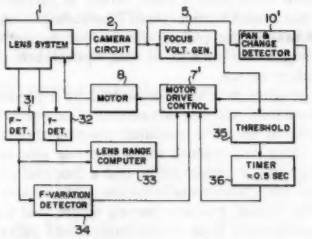
Toshio Murakami, and Kentaro Hanma, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 24, 1983, Ser. No. 460,664

Claims priority, application Japan, Jan. 27, 1982, 57-9997; Jun. 9, 1982, 57-97632

Int. Cl.³ H04N *3/26*

U.S. Cl. 358—227 **16 Claims**



1. An automatic focusing system for a video camera comprising:

(a) means for providing a focus signal on the basis of a video signal of an object being photographed by the video camera;

(b) lens-system position control means including a motor for controlling the position of a lens system in response to said focus signal thereby bringing the lens system to a focus position;

(c) picture-contents change detecting means for detecting a change of the contents of the picture of the object;

(d) motor drive inhibiting means for inhibiting driving of said motor in response to the output signal of said picture-contents change detecting means thereby interrupting the focusing operation,

(e) said picture-contents change detecting means including at least one of picture-contents change indication signal generating means including a low-pass filter having a low cut-off frequency and a level comparator for generating a

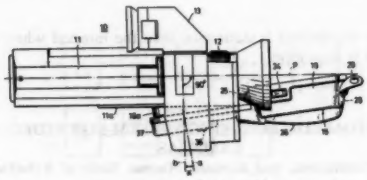
signal indicative of a change of the picture contents by detecting a change of the level of the output signal of said low-pass filter through which the video signal from the object is passed, reduction-factor change detecting means for generating such a picture-contents change indication signal on the basis of a change of the output voltage of a detector detecting the reduction factor of the video camera, and momentary change detecting means including a threshold circuit and a timer circuit for generating such a picture-contents change indication signal by detecting an abrupt change of the focusing signal generated from said focusing signal providing means.

4,531,159

IMAGE PICKUP DEVICE HAVING A HOLDING PART

Takayuki Takubo, Yokohama, and Yoshichi Otake, Kamakura, both of Japan, assignors to Victor Company of Japan, Kanagawa, Japan

Filed Jan. 10, 1983, Ser. No. 456,784
Claims priority, application Japan, Jan. 19, 1982, 57-6569
Int. Cl.³ H04N *5/30*
U.S. Cl. 358—229 **10 Claims**



1. An image pickup device comprising:
a main image pickup body; and
a holding part being angularly rotatable on one side surface of said main image pickup body,
said holding part being mounted to rotate angularly in a plane other than a plane which is parallel to a vertical plane P, said vertical plane P including a center of gravity of said image pickup device and an optical axis or a straight line parallel to said optical axis of said image pickup device,
said holding part being separated by a predetermined distance from said one side surface of said main image pickup body at an accommodated position thereof where said holding part extends along said one side surface of said main image pickup body, and a free end of said holding part lying substantially within said vertical plane P at a fully rotated position thereof where said holding part is drawn out in front of said main image pickup body.

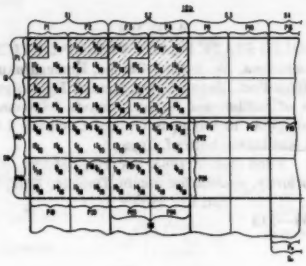
4,531,160

DISPLAY PROCESSOR SYSTEM AND METHOD

Dennis C. Ehn, Newton, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed May 3, 1983, Ser. No. 491,129
Int. Cl.³ H04N *3/12, 5/66, 1/22*
U.S. Cl. 358—240 **5 Claims**

1. A display processor system for reproducing an image in a set of more than two greyscale steps comprising:
a plurality of superpixels each including a number of pixels for providing an output representative of an incident image portion;
means for providing a set of threshold levels for each pixel in a superpixel, which set is different from each of the sets of threshold levels of the other pixels in that superpixel and different from the set of greyscale steps;
means for identifying the position of a given pixel in a superpixel and designating the particular set of threshold levels corresponding to the position of that given pixel;
means for comparing the output of the given pixel with said particular set of threshold levels; and
means, responsive to said means for comparing, for indicating a greyscale step in said set of more than two greyscale steps in response to an output from said given pixel equal to or in excess of at least one of said threshold levels in the set of threshold levels corresponding to that pixel position.

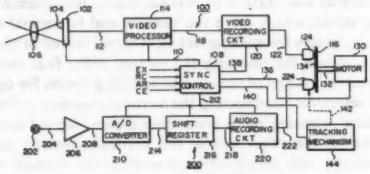


4,531,161

SOUND RECORDING SYSTEM FOR ELECTRONIC STILL CAMERA

Makoto Murakoshi, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 16, 1983, Ser. No. 494,898
Claims priority, application Japan, Jun. 10, 1982, 57-99699
Int. Cl.³ H04N *5/781*
U.S. Cl. 360—10.1 **16 Claims**



1. A sound recording method for an electronic still camera which shoots a scene to record video signals indicative of still images of the scene time-serially on a recording medium, comprising the steps of:
constantly delaying sequentially input, time-serial audio signals by a predetermined period of time; and
sequentially recording the delayed audio signals on the recording medium in response to the shooting, whereby sound is recorded on the recording medium starting from an instant which is precedent to the instant of the shooting by the predetermined period of time.

4,531,162

NOISE CONTROL CIRCUIT FOR SLOW-MOTION/STILL-MOTION VIDEO REPRODUCTION SYSTEM

Junsuke Tokumitsu, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jun. 17, 1982, Ser. No. 389,241
Claims priority, application Japan, Jun. 19, 1981, 56-94669
Int. Cl.³ H04N *5/78*; G11B *21/04*
U.S. Cl. 360—10.3 **7 Claims**

1. A video signal slow-motion or still picture reproduction system comprising:
reproducing means for scanning a tape recorded with an FM

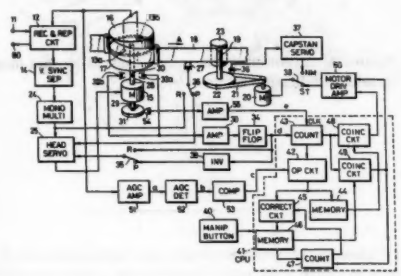
video signal on tracks formed obliquely with respect to the longitudinal direction of the tape, said reproducing means comprising at least one rotary video head for reproducing the FM video signal from said tracks;

tape driving means for driving said tape to travel;

drum pulse obtaining means for obtaining a drum pulse in phase synchronism with the rotation of said rotary video head;

counting pulse generation means for generating a counting pulse in phase synchronism with the rotation of said rotary video head and having a repetition frequency sufficiently high with respect to said drum pulse;

noise detection pulse generation means for generating a noise detection pulse having a pulse width equal to a period in which an envelope of the FM video signal reproduced by said reproducing means is lower than a predetermined level, when the envelope of the FM video signal reproduced by said reproducing means is lower than the predetermined level;



calculation means supplied with said drum pulse, said counting pulse, and said noise detection pulse, for calculating an error between a point corresponding to a vertical blanking period of the reproduced FM video signal and a noise position within said reproduced FM video signal; and

intermittent tape travel and tape travel stopping means for driving said tape driving means with a timing according to the calculated error obtained by said calculation means, and stopping the tape travel by said tape driving means with a timing according to a value obtained by multiplying a coefficient to said error so that said noise position is within said vertical blanking period, to cause intermittent tape travel and to stop the tape travel.

4,531,163
DISC STORAGE ADDRESSING CIRCUIT

Michael Maerkl, Dachau, and Joseph Matzner, Lochham, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

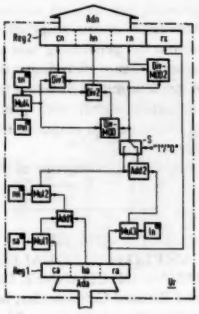
Filed Jul. 6, 1983, Ser. No. 511,231

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1982, 3228359

Int. Cl.³ G11B *5/09*

U.S. Cl. 360—49 **6 Claims**

1. For use in a system having a disc storage device which processes data signals such as a teleprinter-data exchange system, in which the disc storage device's function is to store items of program data and information data relating to individual subscriber stations connected to such system, the combination comprising; apparatus for producing signals for addressing storage zones of a disc storage device of a first type in response to signals which directly address storage zones of a disc storage device of a second type differing from the first type, each of said disc storage devices being subdivided into a plurality of storage cylinders each having a corresponding storage track on each of a plurality of discs, said first disc storage device having storage tracks which are subdivided into a plurality of equal size sectors, each of said sectors having a storage capacity of only part of the storage capacity of a single storage track of the second disc storage device, means connected to receive said signals which address said second type and responsive thereto for converting an information block which designates an address in the second disc storage device into a relative address designating the position of the information block in



question within all of the tracks of said first disc storage device, and means connected to receive said relative address and responsive thereto and to parameters corresponding to the number of storage sectors of said first disc storage device forming a single storage track, for producing signals corresponding to an absolute address designating the addressed information block in said first disc storage device.

4,531,164
CAMERA AND SEPARABLE VIDEO RECORDER/REPRODUCER ARRANGEMENT

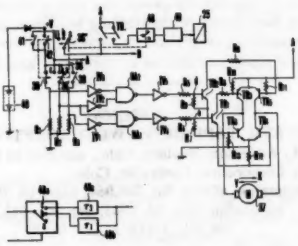
Masaya Maeda; Hiroyuki Takimoto, and Susumu Kozuki, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Feb. 23, 1982, Ser. No. 351,605

Claims priority, application Japan, Feb. 26, 1981, 56-27140; Mar. 6, 1981, 56-32106; Mar. 6, 1981, 56-32107; Jun. 24, 1981, 56-97913

Int. Cl.³ H04N *5/782;* **G11B** *31/00, 1/04, 15/02*

U.S. Cl. 360—33.1 **1 Claim**



1. A video recording system using a video recording tape, comprising in combination:

(a) image pick-up means for receiving an object image and for producing a video signal in response thereto;

(b) recording means for recording the video signal on the video recording tape;

(c) loading means for loading said recording means with the video recording tape;

(d) tape advancing means for advancing the video recording tape relative to said recording means, said advancing means including a capstan driven by a motor and a pinch

roller movable for engaging the tape with said capstan to advance the tape;

(e) actuation means responsive to an actuation signal for actuating said pinch roller so that the pinch roller engages the tape with said capstan;

(f) a first switch for causing said loading means to load said recording means with the tape;

(g) a second switch for producing a recording start instruction;

(h) signal generation means responsive to said recording start instruction for generating said actuation signal, said signal generation means including a delay circuit having a plurality of predetermined different time delays for generating the actuation signal with predetermined different time delays selectively in response to the recording start instruction; and

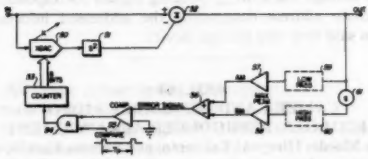
(i) selection means for selecting one of the time delays of said delay circuit.

4,531,165

AUTOMATIC AMPLITUDE EQUALIZER BASED UPON MONITORING OF CHANNEL POWER LOSS

Gene H. Sonu, and Richard C. Schneider, both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 30, 1983, Ser. No. 538,005
Int. Cl.³ G11B *5/45, 5/02*
U.S. Cl. 360—65 **8 Claims**



1. An automatic amplitude equalizer for magnetic recording channels which utilizes a readback training sequence written at the beginning of data every time data is recorded, including:

a summation amplifier receiving the data channel output as one input and a variable feed forward signal from a compensation amplifier as another input signal,

feedback detector means receiving the summation amplifier output for sensing the power lost due to channel variations during the reading of the training sequence, and

means responsive to the detector means for varying the feed forward signal in response to the power loss error signal.

4,531,166

MAGNETIC TAPE DRIVE WITH ADAPTIVE SERVO

Robert L. Anderson, Boulder, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

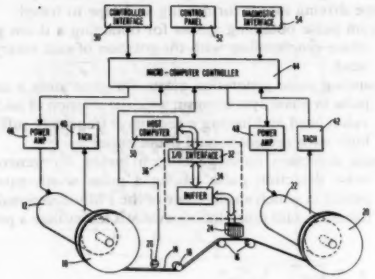
Continuation of Ser. No. 244,064, Mar. 16, 1981,. This application Apr. 11, 1983, Ser. No. 483,895
Int. Cl.³ G11B *15/54, 19/20*
U.S. Cl. 360—73 **19 Claims**

1. Magnetic data storage tape drive apparatus, comprising:

read/write head means;

first and second variable-speed motors, each comprising a spindle adapted for the mounting of tape reels thereon, and tachometer means for measuring the rotational speed of said motors; and

controller means for controlling the speed of said motors, comprising means for applying a predetermined current to said motors during an initialization mode, and means for determining the torque exerted by said motors in response to supply of said predetermined current based on motor speed signals generated by said tachometer means, and means for controlling the current supplied to said motors during an operation mode in response to the output of said



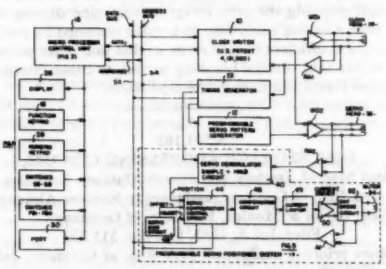
means for determining the torque exerted by said motors in said initialization mode.

4,531,167

SERVOWRITER SYSTEM FOR MAGNETIC DISC DRIVES

James K. Berger, Malibu, Calif., assignor to Pioneer Research, Inc., Santa Monica, Calif.

Filed Aug. 25, 1983, Ser. No. 526,485
Int. Cl.³ G11B *5/012, 5/48*
U.S. Cl. 360—77 **27 Claims**

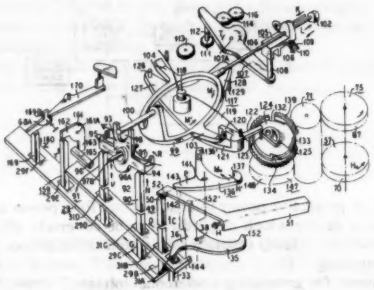


1. A servowriter system for writing odd and even servo information in servo tracks on a magentic disc, said system including: an electromagnetic servo head mounted on a movable arm for writing the odd and even servo information in the servo tracks; a motor for driving the movable arm so as to position the servo head; a servo generator connected to said servo head for introducing servo information to said head to be written on the disc; and a microprocessor control unit connected to said servo generator and to said servo positioner system to cause said servo positioner system to enable said servo generator to cause said servo head to write odd and even servo information in selected tracks on the disc while positioned on the boundaries of odd and even servo information previously written on said disc.

4,531,168
COMPACT CASSETTE TAPE RECORDER WITH MECHANICAL SOFT TOUCH OPERATING AND SWITCHING MECHANISM

Nobuo Suzuki, Kanagawa, Japan, assignor to Technical Incorporated, Tokyo, Japan

Filed Sep. 9, 1982, Ser. No. 416,330
Claims priority, application Japan, Sep. 18, 1981, 56-148370; Sep. 18, 1981, 56-148371
Int. Cl.³ G11B *15/00*
U.S. Cl. 360—96.1 **11 Claims**



1. A cassette tape recorder comprising, a base body **3** which has at one side a push button holder **26**, a group of operating button levers, including at least a pause button lever **33**, a play button lever **49**, a fast forward button lever **90**, a rewind button lever **91**, a record button lever **159** and a stop button lever **169** mounted on said push button holder **26**, a fourth notched cam gear **147** which is coupled to said pause button lever **33**, and a third notched cam gear **124** which is coupled to said fast forward button lever **90** and said rewind button lever **91**, said cam gears **147** and **124** being mounted coaxial and parallel to each other and adapted to separately engage with a driving gear **71** which is coaxially mounted with a fly wheel **65** which is rotated by a motor M, and a first notched cam gear **57** coupled to said play button lever **49**, and a second notched cam gear **75** coupled to said record button lever **159**, said cam gears **57** and **75** being mounted coaxial and parallel to each other arranged and adapted to separately engage withsaid driving gear **71**, whereby upon depression of selected ones of said operating button levers (**33, 90, 91, 49, 159**) the associated notched cam gears (**147, 124, 57, 75**) are respectively turned to a given angle by said gear **71** to move a head base **4**.

4,531,169
READ/WRITE HEAD-POSITIONING APPARATUS FOR A MAGNETIC RECORDING DISK DRIVE UNIT

Kenneth M. Daniels, 125 Roberta Dr., Woodside, Calif. 94062

Filed Mar. 1, 1982, Ser. No. 353,690
Int. Cl.³ G11B *5/012*
U.S. Cl. 360—98 **8 Claims**

1. Head positioning apparatus for magnetic recorders and the like comprising:

an elongated electromagnetic stator assembly having an armature member receiving slot extending therealong;

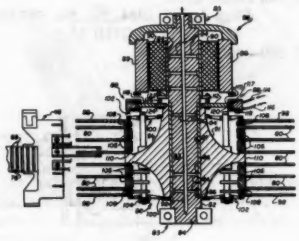
an armature assembly arranged for movement relative to said stator assembly to carry a head assembly connected thereto relative to an associated recording medium, said armature assembly including

an elongated electromagnetically driveable armature member disposed within said slot and having a first end extending beyond one end of said stator assembly and a second end extending beyond the opposite end of said stator assembly; and

carriage means for supporting said armature member and allowing it to be driven along its longitudinal axis relative to said stator assembly, said carriage assembly including

a pair of guide block means respectively disposed on opposite sides of said stator assembly, each said block means having a slideway formed therein and extending therethrough in a direction parallel to said longitudinal axis,

a pair of elongated bearing shafts disposed to extend through respective ones of said slideways, and

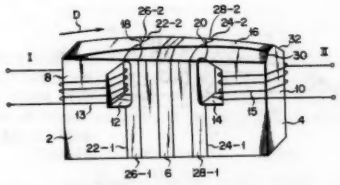


end bracket means coupling the corresponding ends of said shafts to each other and to the corresponding ends of said armature member, said end bracket means being rigidly attached to one of said shafts and pivotally attached to the other whereby said shafts remain free to self align themselves relative to said slideways as they transport said armature member from one end of its travel extent to the other.

4,531,170
COMBINATION MAGNETIC HEAD

Shushi Takei, Yokohama, and Akio Onuki, Ichikawa, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 13, 1982, Ser. No. 377,843
Claims priority, application Japan, May 18, 1981, 56-73480
Int. Cl.³ G11B *5/12*
U.S. Cl. 360—119 **6 Claims**



1. A magnetic head comprising:

a first core formed of magnetic material and having first surface section to be slidably contacted with a tape and first gap formed on the first surface section,

a first winding provided on said first core,

a second core formed of magnetic material and having second surface section to be slidably contacted with a tape and second gap formed on the second surface section,

a second winding provided on said second core, said first and second cores defining a longitudinal direction, and

a spacer interposed between said first and second cores to integrally coupled said first and second cores, said spacer having a third surface section to be slidably contacted with a tape and formed of non-magnetic material, the third surface section continuously arranged between the first and second surface sections to define a head face to be run with a tape, said head face including cut-away edge por-

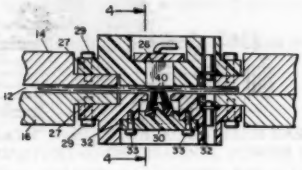
tions in a circular-arc-shape along the running direction of the tape, with said cut-away edge portions being dimensioned such that said first surface section has an area larger than that of said second surface section.

4,531,171

BIDIRECTIONAL BRUSH PRESSURE SOURCE FOR MAGNETIC READ/WRITE HEADS

John C. McCann, La Mesa, Calif., assignor to Cubic Western Data, San Diego, Calif.

Filed Apr. 6, 1984, Ser. No. 597,507
Int. Cl.³ G11B *15/60*
U.S. Cl. 360—130.3 **12 Claims**



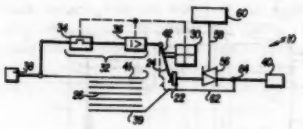
1. A ticket read/write head assembly comprising:
a transducer;
means for transporting a ticket back and forth past said transducer in opposite directions along a path; and
bi-directional pressure brush means positioned adjacent said transducer for biasing a ticket against said transducer with uniform pressure during movement in either of said opposite directions.

4,531,172

ELECTRIC CIRCUIT BREAKER WITH A REMOTE CONTROLLED STATIC SWITCH

Jean-Luc Mertz, Grenoble, France, assignor to Merlin Gerin, France

Filed Sep. 2, 1983, Ser. No. 528,982
Claims priority, application France, Sep. 17, 1982, 82 15841
Int. Cl.³ H01H *73/18*
U.S. Cl. 361—13 **7 Claims**



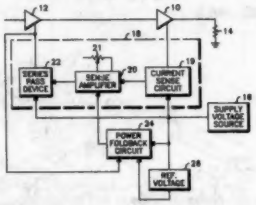
1. An electric circuit breaker comprising:
a pair of cooperating separable contacts;
an operating mechanism for moving said contacts between open and closed positions;
a trip device automatically actuated to a tripped position when an overload current exceeds a predetermined threshold current, said trip device cooperating with said operating mechanism for moving said contacts to the open position;
a static switch comprising a controlled rectifier device, said controlled rectifier device being a member of the group of a triac and two reversely connected thyristors, said switch being electrically connected in series with said separable contacts, and being rated for carrying and breaking a nominal load current;
a shunt circuit for bypassing said static switch upon the occurrence of said overload current; and
control means for rendering said shunt circuit conductive when an arc is drawn between said separable contacts.

4,531,173

PROTECTIVE POWER FOLDBACK CIRCUIT FOR A POWER SEMICONDUCTOR

Noriyuki Yamada, Tokyo, Japan, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 2, 1983, Ser. No. 548,058
Int. Cl.³ H02H *9/04*
U.S. Cl. 361—86 **15 Claims**



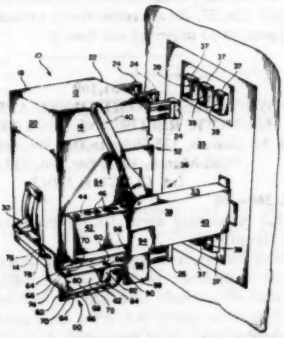
1. A protective power foldback circuit for a power semiconductor device which may otherwise be adversely affected by variations of load, supply voltage, and drive power thereto, comprising:
means for generating a reference voltage;
means for sampling the supply voltage applied to the power semiconductor device;
means for comparing said reference voltage and said sampled supply voltage and generating a foldback control signal in response to an excess of applied supply voltage; and
means for reducing the drive power applied to the power semiconductor device by a predetermined amount greater than that produced by said excess of applied supply voltage in response to said foldback control signal.

4,531,174

DRAW-OUT CIRCUIT BREAKER WITH IMPROVED EXTERNAL CONNECTORS

Bernard C. Rickmann, Peru, Ind., assignor to Square D Company, Palatine, Ill.

Division of Ser. No. 315,566, Oct. 27, 1981, Pat. No. 4,491,896.
This application May 24, 1984, Ser. No. 613,478
Int. Cl.³ H02B *11/12*
U.S. Cl. 361—339 **4 Claims**



1. An improved draw-out circuit breaker having a plurality of line terminals and load terminals, a respective male connector extending from each said line terminal and from each said load terminal, each connector adapted to be received in a respective female connector of a switchboard which includes an interior rear wall, said male connectors comprising;

a generally rectangular shaped conductive block, said block having a base portion at one longitudinal end and an engaging portion at its opposite longitudinal end, said base portion and said engaging portion each including a top and bottom surface, said block being electrically connected to a respective terminal at said base portion, said engaging portion including a pair of channels in back-to-back relationship on said top and bottom surfaces respectively, each channel including a ridge at opposite ends thereof;

a clip member retained in each said channel, each clip member having a leg extending longitudinally within said respective channel intermediate said opposite ridges,

a helical coil provided in each said channel in encircling relationship to said leg; and

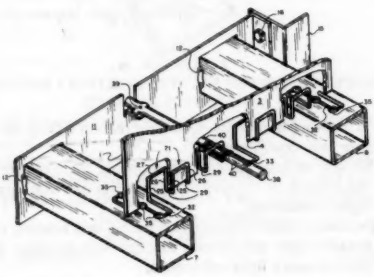
a crimp provided in a portion of each ridge securely engaging said clip member within each said channel.

4,531,175

PRINTED WIRING BOARD GUIDE

William A. Reimer, Wheaton, Ill., assignor to GTE Communication Systems Corporation, Northlake, Ill.

Filed Jun. 20, 1984, Ser. No. 622,529
Int. Cl.³ H05K *7/18*
U.S. Cl. 361—399 **5 Claims**



1. A printed wiring board guide with a vertically oriented printed wiring board wherein said board is supported on a pair of support beams engaging a lower edge of said board, the beams connected to a support arm attached to a frame including at least one vertical upright, said guide comprising:

a plurality of guide fingers of wire construction formed parallel to said printed wiring board extending in an upward direction from said lower edge, and alternately positioned on a first and a second side of said printed wiring board;

a plurality of joining members of wire construction connecting said guide fingers;

a plurality of attachment members of wire construction formed in a plane perpendicular to said fingers and adjacent to said lower edge, said attachement members connected to said joining members in said board guide, and said attachment members formed at each of a first and a second opposite end of said guide, and formed at an intermediate position in said guide between said end attachment members, said end attachment members each connected to a respective one of said support beams; and

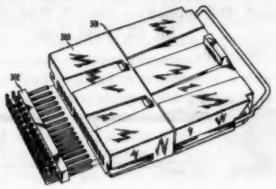
an aligner rod, said aligner rod attached to said support arm and connected to said intermediate attachment members to align while not supporting said guide.

4,531,176

CARTRIDGE HAVING IMPROVED ELECTROSTATIC DISCHARGE PROTECTION

Robert L. Beecher, II, Indianapolis, Ind., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 27, 1983, Ser. No. 507,757
Int. Cl.³ H05K *5/03*
U.S. Cl. 361—424 **6 Claims**



1. A cartridge with front and rear ends having connector means located at its front end, said connector means including metallic contacts for engaging electrical terminals of a mating connector, the cartridge comprising:

a circuit board having one or more electronic components and said connector means electrically interconnected and mounted thereon;

a first dielectric enclosure, comprising a hollow rectangular cavity with an opening at one end, enclosing the circuit board at the rear end of the cartridge; and

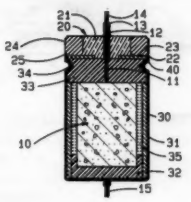
a second dielectric enclosure, comprising a hollow rectangular cavity with an opening at one end and a plurality of spaced holes at the other end for admitting the electrical terminals of a mating connector, enclosing the circuit board at the front end of the cartridge, said first and second dielectric enclosures being removably attached to each other at their respective openings and forming a continuous seam at their points of attachment, said seam being approximately equidistant from the front end of the cartridge at all points, said metallic contacts of the connector means being fully recessed within the spaced holes of the second dielectric enclosure, the assembled cartridge having no apertures therein other than said plurality of spaced holes, whereby said one or more electronic components mounted on the circuit board are rendered inaccessible to sources of static discharge.

4,531,177

ELECTROLYTIC CAPACITOR CONTAINING A HYDROCHLORIC ACID ELECTROLYTE

George A. Shirn, Williamstown, and William J. Pfister, Cheshire, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Jan. 9, 1984, Ser. No. 569,534
Int. Cl.³ H01G *9/02*
U.S. Cl. 361—433 **6 Claims**



1. An electrolytic capacitor comprising an anodized tantalum porous pellet anode, said anode being housed in a metal container serving as cathode open at one end, a seal for said open end, and an electrolyte contacting said anode and said cathode, said electrolyte consisting essentially of an azeotrope

solution of hydrochloric acid and water containing about 20 wt% hydrochloric acid, and said container is selected from the group consisting of tantalum, silver and copper.

4,531,178

DIVER'S FLASHLIGHT

Alan K. Uke, 247, S. Rios, Solana Beach, Calif. 92075

Continuation-in-part of Ser. No. 292,897, Aug. 14, 1981, abandoned. This application Jan. 17, 1984, Ser. No. 571,501

Int. Cl.³ F21L 7/00

U.S. Cl. 362—158 **13 Claims**

1. A diver's flashlight suitable for underwater use comprising:

(a) a hollow, substantially cylindrical casing having an open end and a closed end and adapted to receive a battery pack comprising one or more batteries;

(b) a hollow, substantially cylindrical barrel having a transparent window at one end and having an open end at the other end thereof which is adapted to telescopically interfit with the open end of the casing;

(c) a reflector means position within the barrel having a central aperture therein adapted to receive a light bulb;

(d) manually operable means to connect the open ends of the casing and the barrel in a telescoped position which allows relative movement between the casing and the barrel along the longitudinal axis thereof;

(e) sealing means between the telescoped surfaces of the casing and the barrel to prevent the penetration of water into the interior of the flashlight when the flashlight is used underwater; and

(f) means to electrically connect and disconnect the terminals of the battery pack with the light bulb when the casing and barrel are telescopically moved toward and away from each other along the longitudinal axis thereof.

4,531,179

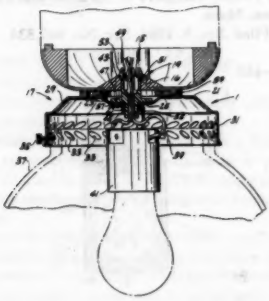
LIGHT FIXTURE

Ronald D. Baker, Conway, Ark., assignor to American Industries, Inc., Conway, Ark.

Filed Mar. 19, 1984, Ser. No. 590,774

Int. Cl.³ F21P 5/00

U.S. Cl. 362—371 **6 Claims**



1. A light fixture for mounting at the bottom of a switch housing of a ceiling fan, the bottom of the switch housing having a circular opening therein, the fixture comprising a top member and a contractible and expansible locking member secured in said top member of the fixture and extending upwardly therefrom, said locking member being adapted to contract for insertion of the member through the opening in the bottom of the housing and expand for locking the fixture to the housing, said locking member being generally tubular for the passage of wiring from the light fixture into the switch housing and having slots extending down from its upper end dividing it into a plurality of resilient fingers, said fingers having outwardly extending lugs at their upper ends, the maximum outside diameter of the member at its upper end being greater than the diameter of the opening in the housing, said locking member being contractible to a diameter which is sufficiently small to permit passage of the lugs through said opening and expansible to a diameter whereby the lugs extend to a greater diameter than the opening and engage the switch housing for locking the fixture in place.

4,531,180

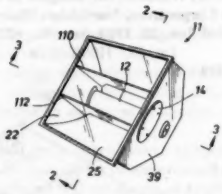
INTERNAL SHIELD FOR TROUGH-LIKE REFLECTOR

Jose A. Hernandez, San Marcos, Tex., assignor to Wide-Lite International, Inc., San Marcos, Tex.

Filed Dec. 17, 1980, Ser. No. 217,545

Int. Cl.³ F21V 7/00

U.S. Cl. 362—297 **6 Claims**



1. A lighting fixture for mounting therein a lamp having an elongate axis, comprising

a housing at least partially surrounding the elongate axis of the lamp so as to leave an opening on one side thereof for light emanations,

a parabolic reflector positioned within said housing to cause parallel light emanations through said housing opening from primary light reflections,

at least one end reflector cutting across the elongate lamp axis for radiating primary light reflections from the lamp through said opening, and

a light spill shield parallel to the lamp axis and to one side thereof having a cross-section parallel to the parabolic reflector emanations,

said shield including an undercut opening for permitting primary light reflections from the lamp over substantially the entire parabolic reflector on the other side of said shield from the lamp,

said shield having a depending portion for shielding against primary reflections emanating through the opening from that portion of said end reflector on the other side of said shield from the lamp.

4,531,181

HIGH VOLTAGE POWER SUPPLY

Harold L. Herz, Binghamton; Sam S. Jobes, Vestal, both of N.Y.; John D. Jordan, Chesapeake, Va.; David P. Benfey, Endicott, and William C. Wheeler, Conklin, both of N.Y., assignors to General Electric Company, Binghamton, N.Y.

Filed Dec. 22, 1982, Ser. No. 452,113

Int. Cl.³ H02M 3/335

U.S. Cl. 363—21 **7 Claims**

1. A regulated high voltage power supply comprising:

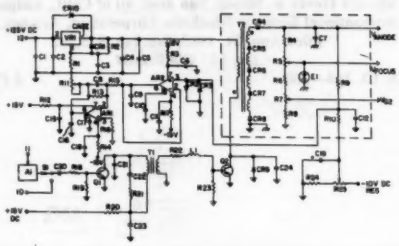
means for receiving an input voltage;

A flyback power transformer having a primary winding and a single secondary output winding, the primary winding receiving the input voltage, the output winding providing an output high voltage for driving a load;

means for providing excitation pulses to the primary winding for driving the transformer;

means for sampling the output high voltage;

means for inverting and amplifying the sampled output and providing a feedback voltage signal; and



a series controllable voltage regulator connected in circuit between the receiving means and the transformer primary winding for regulating the input voltage, the regulator further receiving the feedback voltage signal for regulating the output high voltage against variations due to the load;

means for providing a second output voltage derived from the output high voltage and means for adjusting the level of the second output voltage.

4,531,182

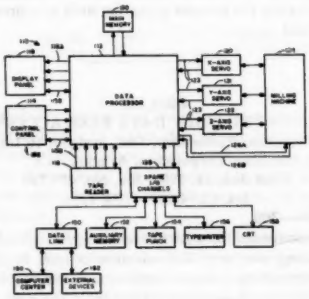
MACHINE CONTROL SYSTEM OPERATING FROM REMOTE COMMANDS

Gilbert P. Hyatt, 11101 Amigo Ave., Northridge, Calif. 91324

Continuation-in-part of Ser. No. 229,213, Apr. 13, 1972, Pat. No. 3,820,894, Ser. No. 135,040, Apr. 19, 1971, , Ser. No. 134,958, Apr. 19, 1971, , Ser. No. 101,881, Dec. 28, 1970, , and Ser. No. 879,293, Nov. 24, 1969, abandoned. This application Mar. 1, 1972, Ser. No. 230,872

Int. Cl.[3] G06F *15/46*

U.S. Cl. 364—131 **33 Claims**



1. A computerized machine control system comprising:

an output date link for communicating machine information to a remote computer in response to a data link output signal;

an input data link for inputting machine command information from a remote computer source of machine command information;

a machine command memory for storing machine command information;

an operator control panel for generating machine command information in response to operator action;

select means for providing a plurality of machine command source select signals;

a stored program computer for processing machine command information in response to a stored computer program; said computer including means for receiving machine command information from said input data link in response to a first source select signal, means for receiving machine command information from said machine command memory in response to a second source select signal, means for receiving machine command information from said operator control panel in response to a third source select signal, means for storing the computer program, means for processing the machine command information received in response to a source select signal under control of the stored computer program, means for generating the data link output signal to said output data link in response to said processing of the machine command information with said processing means to communicate the machine information to said remote computer, means for generating a machine related display signal in response to the processing of the machine command information with said processing means, and means for generating a machine control signal in response to said processing of the machine command information with said processing means;

a display for displaying machine-related information to an operator in response to the display output signal; and

a controller for controlling a machine in response to the machine control signal.

4,531,183

INFORMATION RECORDING MATERIAL

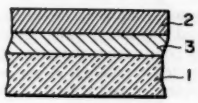
Isao Morimoto; Masafumi Nakao, and Koichi Mori, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 346,187, Feb. 5, 1982, abandoned. This application May 18, 1984, Ser. No. 611,394

Claims priority, application Japan, Feb. 23, 1981, 56-24218

Int. Cl.[3] G01D *15/34*

U.S. Cl. 346—135.1 **16 Claims**



1. An information recording material having a high sensitivity, S/N ratio and archivability comprising a substrate and a metallic recording layer having an upper and lower side supported by said substrate, said metallic recording layer comprising a Bi film containing at least one rare earth element selected from the group consisting of Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu, the content of Bi in said metallic recording layer being in the range of 50 to 84% in number of atoms.

4,531,184

CONVERSATIONAL VIDEO SYSTEM HAVING CONTACT SELECTION CONTROL

Jack S. Wigan; David G. Ure, both of London, and John M. Richards, Blewbury, all of England, assignors to Reuters, Ltd., London, England

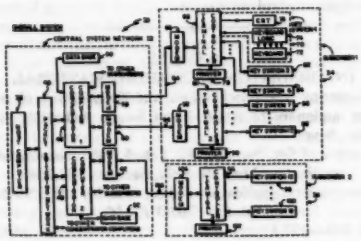
Continuation-in-part of Ser. No. 230,341, Jan. 30, 1981, Pat. No. 4,388,489. This application Mar. 30, 1983, Ser. No. 480,331

Int. Cl.[3] G06F *3/14*

U.S. Cl. 364—200 **44 Claims**

1. In a video communication network capable of providing textual data messages to a plurality of subscriber terminals

throughout said network, at least a portion of said plurality of subscriber terminals comprising subscriber keystations, each of said subscriber keystations comprising a keyboard means for operator input of textual data mesages and associated data control signals to said network via said keyboard means and a video display means for providing a textual video display of at least keyboard generated data input to said network; the improvement comprising at least one message switching interface means for routing video conversational textual data messages throughout said network, a plurality of said keystations being operatively connected to said one message switching interface means, said one message switching interface means comprising mesage routing logic means and storage means operatively connected to said message routing logic means for providing message routing logic control signals and further comprising display control logic means and local video display storage means for locally storing video conversational textual data for providing a video display thereof to at least a pair of said keystations which are operatively connected together through said one interface means in a completed call in said network, said keyboard means comprising means for providing unique calling signals to said interface means for initiating calls to a designated keystation portion of said plurality of keystations in said network, said one interface means further comprising means for receiving said calling signals provided thereto for completing a call to said designated connected keystation, said message routing logic means comprising means for controlling the routing of said calling signals to said designated keystations to control the completion of said initiated calls, said display



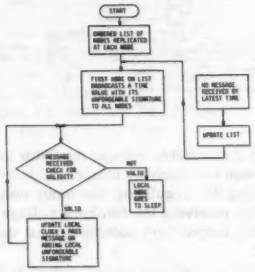
control logic means comprising means for providing on said pair of connected keystation video display means a video display of video conversational textual data transmitted between said connected keystations in said network with which said call is completed via said separate keyboard means associated with said pair of connected keystations, said one message switching interface means storage means comprising means for retrievably storing at least one subscriber created contact list for each of said keystations connected to said one message switching interface means, each of a plurality of said keyboard means being capable of providing at least a different one of said subscriber created retrievably stored contact lists to said one message switching interface storage means for each of a corresponding plurality of associated ones of said subscriber keystations whereby a plurality of different unique contact lists may be retrievably stored in said one message switching interface storage means, said contact lists each capable of comprising a plurality of different unique designated keystation identification codes each of which corresponds to a different keystation in said network, said keystation keyboard means unique calling signal providing means being capable of providing a unique contact list calling signal corresponding to a designated one of said retrievably stored contact lists to said one message switching interface means message routing logic, said message routing logic comprising means capable of retrieving said stored one designated contact list in response to said unique contact list calling signal and sequentially providing a calling signal to each of said keystations designated by said identification codes in said contact list until a call is completed with the first one of said designated keystations which is available, whereby a single call may be simultaneously initiated by a subscriber keystation to a plurality of predesignated keystations to establish a textual data video conversation with the first free subscriber in said plurality.

4,531,185

CENTRALIZED SYNCHRONIZATION OF CLOCKS

Joseph Y. Halpern, Cupertino; Barbara B. Simons, Scotts Valley, and Hovey R. Strong, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 31, 1983, Ser. No. 528,282
Int. Cl.³ G06F *1/04*
U.S. Cl. 364—200 **8 Claims**



1. A method for periodically synchronizing local clocks in a network of counterpart communicating CPU's (nodes), both the drift rate between the clocks and the network message transit and processing time being bounded, comprising the steps of:

(a) forming an ordered list of node identities and replicating the list at each node;

(b) broadcasting a time value with its unforgeable signature to all nodes including itself by the first node on the list; and

(c) multiple message exchanging of the time value among the nodes wherein either a value convergence is secured or the next node on the list broadcasts another time value in the manner of the first and submits to a multiple message exchanging, the process repeating until synchronization is achieved.

4,531,186

USER FRIENDLY DATA BASE ACCESS

John M. Knapman, Richardson, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

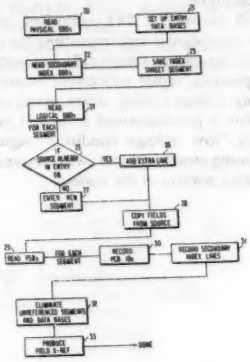
Filed Jan. 21, 1983, Ser. No. 459,792
Int. Cl.³ G06F *7/00, 9/06*
U.S. Cl. 364—300 **6 Claims**

1. An improvement in a data base management system of the type requiring user specified selection criteria in association with corresponding program communication blocks (PCBs) selection in order to access information in the data base, said improvement being a method for simplifying the user's query task, comprising the steps of:

constructing a set of entry data bases from definitions of said data bases and PCBs, said entry data bases each consisting of a single hierarchical structure that shows every physical and logical path accessible from one physical root segment with duplicate logical and physical paths being consolidated,

displaying said entry data bases to the query user as a menu from which segments, fields and PCBs can be selected,

evaluating all possible access paths to the segments to be retrieved in the user query, and



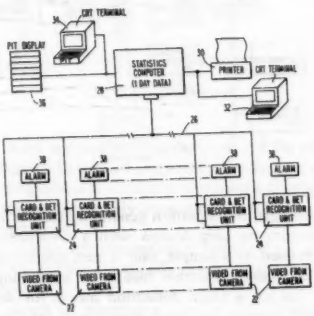
selecting the optimum access path according to weighted priorities.

4,531,187

GAME MONITORING APPARATUS

Joseph C. Uhland, 1020 Kresson Rd., Cherry Hill, N.J. 08003

Filed Oct. 21, 1982, Ser. No. 435,776
Int. Cl.³ G06F *15/28*
U.S. Cl. 364—412 **9 Claims**



1. A system for monitoring the play of a gambling game of chance, the outcome of which depends on the outcome of a random physical occurrence, comprising:

means for determining the bets placed by each player;

means for optically monitoring the outcome of said random occurrence;

means for determining whether each player has won or lost his bet at the termination of each round of play;

means for determining whether each player's bet has either been correctly paid out or collected from him;

means for determining whether conditions exist which would tend to alter the odds ordinarily applicable to the game being played; and

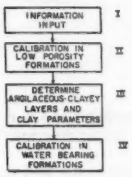
means for generating an alarm signal in the event that an error is made in the play, such that the rules of the game are broken, or that such conditions exist; wherein said means for determining the bets placed and said means for optically monitoring comprise means for analyzing an optical image formed by a video camera and for generating a numeric representation thereof.

4,531,188

METHODS FOR AUTOMATIC PROCESSING OF INFORMATION OBTAINED BY WELL LOGGING

André Poupon, Paris, and Jean-Claude Favard, Fontenay aux Roses, both of France, assignors to Schlumberger Technology Corporation, Ridgefield, Conn.

Continuation of Ser. No. 310,484, Nov. 29, 1972, abandoned.
This application Jun. 2, 1981, Ser. No. 269,737
Int. Cl.³ G06F *15/20*; G01V *5/00*
U.S. Cl. 364—422 **44 Claims**



1. A machine method for exploring subsurface earth formations within the earth formation surrounding a borehole formed in the earth formation by probing a plurality of depth levels of such subsurface earth formation with one or more signals produced in an investigating device adapted to be suspended in said borehole and acquiring and analyzing signals responsive to said probing signals, comprising the steps of:

(a) providing electrical signals representative of formation characteristics over a plurality of depth levels of the borehole, said electrical signals being derived from signals responsive to the reaction of the subsurface earth formation to probing signals emitted into said subsurface earth formation surrounding the borehole from a source of said probing signalings located in said investigating device;

(b) combining at least some of said electrical signals to compute at least two parameters related to the amount of clay in the formation;

(c) determining, by means of the said parameters, the most argilaceous level of each of said intervals;

(d) selecting from all the most argilaceous levels of each interval the best one, called the pivot level; and

(e) computing on the basis of electrical signals representative of formation characteristics of the pivot level, clay parameters valid for the entire interval in which said pivot level is located.

4,531,189

DATA CONVERSION, COMMUNICATION AND ANALYSIS SYSTEM

John E. Mosier; Jim B. Surjaatmadja; George B. McLawhon, and Jack C. Penn, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

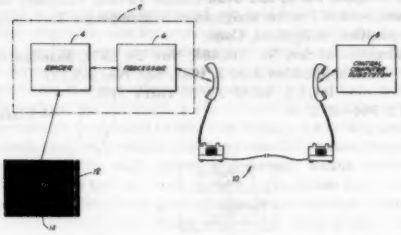
Filed Mar. 8, 1982, Ser. No. 355,317
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—550 **8 Claims**

5. A method of obtaining the expeditious analysis of data, initially occurring in visible graphic form, obtained from a well at a well site, comprising the steps of:

optoelectronically converting, at the well site, the data from graphic form to corresponding electrical signals;

substantially immediately electronically transmitting said electrical signals from the well site to a computer located remotely from the well site;

transmitting along with said electrical signals a verbal communication conveying information related to said data;



creating with said computer and in response to said verbal communication an output descriptive of the graphic data; and

transmitting said output to the well site.

4,531,190

ELECTRONIC ENGINE CONTROL SYSTEM WITH EMERGENCY OPERATION MODE

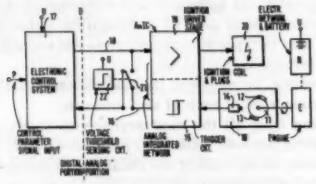
Ulrich Drews, Vaihingen/Enz; Manfred Mezger, Markgröningen; Bernhard Schmidt, Leonberg; Karl Seeger, Markgröningen; Gerhard Söhner, Remshalden, and Herman Roozenbeek, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 3, 1982, Ser. No. 345,225

Claims priority, application Fed. Rep. of Germany, May 22, 1981, 3120360; Jan. 11, 1982, 3200856

Int. Cl.[3] **F02P** *11/06, 5/02;* **G01R** *19/165*

U.S. Cl. 364—431.11 **16 Claims**



1. Electronic engine control system for an internal combustion engine (E) with emergency operation mode having

means (N) providing an operating voltage (U) of varying low-voltage levels;

a transducer (10) coupled to the engine (E) and providing engine speed signals;

a trigger circuit (15) coupled to the transducers, receiving the engine speed signals and providing trigger signals;

a digitally operating signal processing stage (17) receiving

(a) operating voltage (U) from said voltage providing means (N), and

(b) the trigger signals, and providing digitally processed output control signals;

coupling circuit means (19) receiving said processed output control signals and providing engine operating signals;

engine operation elements (20) coupled to the engine operating signals for controlling operation of the engine (E),

said trigger circuit and said coupling circuit means forming at least part of an analog portion of the system in which the signals occurring therein are processed in analog mode, and said digital signal processing stage forming a digital portion of the system in which the signals occurring therein are processed in digital mode;

voltage level sensing means (22) coupled to the operating voltage providing means (N) and providing operating voltage level signals representative of, respectively, operating voltage above or below a predetermined level, and thus indicating either "adequate voltage" or "low voltage" conditions;

and switch means (21, 21') controlled by said operating voltage level signals and connecting the trigger signals to the coupling circuit means (19) and bypassing said digitally operating signal processing stage (17) when said operating voltage sensing means senses an operating voltage below a predetermined level and provides a corresponding "low voltage condition" signal, said voltage level sensing means and said switch means forming part of said analog portion of the system.

4,531,191

ELECTRON BEAM PATTERN GENERATION SYSTEM

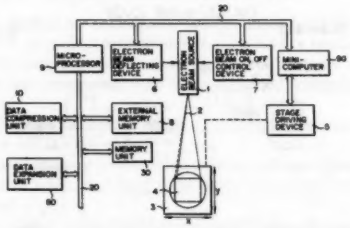
Kiyomi Koyama, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 28, 1981, Ser. No. 334,913

Claims priority, application Japan, Dec. 26, 1980, 55-185926

Int. Cl.[3] **G06F** *15/40*

U.S. Cl. 364—491 **6 Claims**



1. A charged beam pattern generating system for drawing a beam pattern on chip frames with a prescribed width and length defined on a sample, said system comprising:

a charged beam projection means for projecting a charged beam having a beam deflection means for deflecting the charged beam in the width direction of the chip frame;

a stage for carrying the sample continuously in the length direction of the chip frame;

means for on-off controlling the charged beam according to digital data with said digital data consisting of "1's" and "0's";

compressing means for compressing data obtained for individual stripe regions of each chip frame, said stripe regions having the same length as the chip frame in the direction of movement of said sample stage and having a width obtained by uniformly dividing the chip frame in the perpendicular direction;

means for storing into a memory bank, all of said compressed stripe data in a stage which is made into a high speed sequential access buffer at the time of reading out the stripe data without the need for dividing said memory bank into different high speed sequential access buffers for the individual stripes, by continuously using the address space covering all the memory areas of the memory bank; and

data expansion means for expanding the stored compressed data into blanking data consisting of "1's" and "0's" for on-off control of said charged beam.

4,531,192

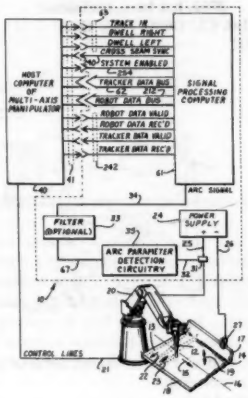
APPARATUS AND METHOD FOR SENSING A WORKPIECE WITH AN ELECTRICAL ARC

George E. Cook, Nashville, Tenn., assignor to CRC Welding Systems, Inc., Nashville, Tenn.

Filed Sep. 23, 1982, Ser. No. 422,369

Int. Cl.[3] G06F *15/46;* B23K *9/12;* G05B *19/42*

U.S. Cl. 364—513 49 Claims



1. Apparatus for sensing with an electrical arc the topography of a workpiece having an electrically conductive surface and for providing data representative of the sensed topography to a control means operatively associated with a manipulator apparatus, comprising:

means for continuously generating an electrical arc between an electrode and the electrically conductive surface of the workpiece;

measuring means for measuring a parameter of said arc and for providing an arc signal having a magnitude related to the distance between said electrode and said surface of the workpiece;

means responsive to said arc signal for detecting the spacing between said electrode and the surface of the workpiece and for providing a minimum arc signal when the electrode approaches within a predetermined minimum distance from the surface and a maximum arc signal when the electrode exceeds a predetermined maximum distance from the surface;

means associated with said control means for causing said manipulator to move said electrode with respect to the workpiece surface and responsive to said minimum arc signal and said maximum arc signal for maintaining said electrode between said predetermined minimum distance and said predetermined maximum distance from the surface to maintain said electrical arc continuously as said electrode is moved; and

signal processing means responsive to said arc signal for providing output data representative of the sensed continuous topography of the workpiece to said control means.

4,531,193

MEASUREMENT APPARATUS

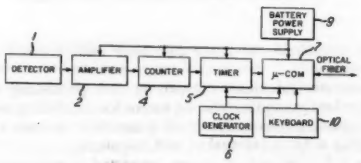
Takeshi Yasuhara, and Eiichi Nabeta, both of Tokyo, Japan, assignors to Fuji Electric Company, Ltd., Kawasaki, Japan

Filed Jul. 27, 1982, Ser. No. 402,377

Claims priority, application Japan, Jul. 30, 1981, 56-118412; Jul. 30, 1981, 56-118413; Jul. 30, 1981, 56-118414; Jul. 30, 1981, 56-118415; Jul. 30, 1981, 56-118416; Jul. 30, 1981, 56-118417; Aug. 3, 1981, 56-120723; Aug. 3, 1981, 56-120724; Aug. 15, 1981, 56-127336; Aug. 26, 1981, 56-132750; Aug. 28, 1981, 56-134224; Aug. 28, 1981, 56-134225

Int. Cl.[3] G06F *15/20*

U.S. Cl. 364—551 7 Claims



1. An apparatus for measuring a physical quantity and providing corresponding measurement data comprising:

(a) transducer/converter means for converting a physical quantity being measured to a corresponding frequency signal having a frequency which is related to the physical quantity, the transducer/converter means including a transducer for converting the physical quantity being measured to a corresponding voltage signal, and a converter circuit having: a capacitor, means including a constant current source for selectively charging and discharging the capacitor, comparator means for comparing a voltage across the capacitor with the voltage signal and for providing an output signal when the voltage across the capacitor is equal to or greater than the voltage signal, and monostable flip-flop means responsive to the output signal from the comparator means for providing a sequence of pulses having a frequency related to the voltage signal;

(b) counter means responsive to the frequency signal for providing a digital quantity related to the frequency of the frequency signal;

(c) digital processor means for performing predetermined processing operations on the digital quantity and providing measurement data corresponding to the physical quantity being measured; and

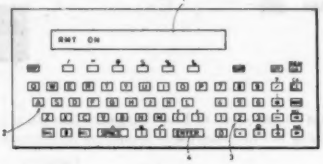
(d) a clock signal generator for providing a periodic sequence of clock pulses and wherein the counter means include a first counter circuit for counting the frequency cycles of the frequency signal commencing at the start of a measurement interval and for providing a counter ouput signal after a predetermined number of cycles have been counted and a second counter circuit for counting the sequence of clock pulses commencing at the start of the measurement interval and responsive to the counter output signal for stopping the counting of clock pulses and providing count data, and wherein the digital processor means is responsive to the counter output signal for reading the count data and for performing the predetermined processing operations thereon.

4,531,194

TAPE RECORDER DRIVE SYSTEM IN A PROGRAMMABLE ELECTRONIC CALCULATOR

Masuaki Morino, Soraku; Yoshiyuki Fujikawa; Isamu Haneda, both of Nara, and Tetsuo Myoi, Soraku, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 9, 1982, Ser. No. 440,303
Claims priority, application Japan, Nov. 11, 1981, 56-181358
Int. Cl.³ G06F *3/06, 3/16*
U.S. Cl. 364—705 **5 Claims**



1. A combined electronic calculator and recorder system comprising:

an electronic calculator comprising data processing means, control means and interfacing means for interfacing said data processing means and control means with at least two recording devices external of said calculator;

at least a first recording device connected to said interfacing means for storing program information and data for said data processing means;

at least a second recording device connected to said interfacing means for recording and outputting operational instructions;

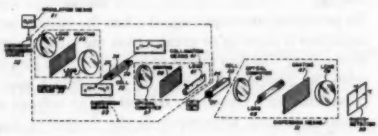
said control means comprising means for independently controlling operation of said first and second recording devices, respectively.

4,531,195

POLYCHROMATIC TIME-INTEGRATING OPTICAL PROCESSOR FOR HIGH-SPEED AMBIGUITY PROCESSING

John N. Lee, 13208 Dauphine St., Silver Spring, Md. 20906

Filed May 16, 1983, Ser. No. 495,028
Int. Cl.³ G06G *9/00*; G02B *5/18*; G01S *13/58*
U.S. Cl. 364—822 **20 Claims**



1. Apparatus for spatially evaluating the ambiguity integral using a beam of incoherent broadband light with component waves comprising:

modulation means for modulating the broadband beam of incoherent light by a reference signal;

a first linear acoustic cell disposed with its longitudinal axis parallel to a first spatial dimension;

first dispersion means for dispersing along the first spatial dimension and bringing to a focus along the longitudinal axis of the first cell the modulated beam of incoherent broadband light in which the component waves are each modulated by a different Doppler-shifted variation of the reference signal;

a first transducer coupled for inputting to the first cell a test signal as a travelling wave to scatter by Bragg diffraction the light focussed along the longitudinal axis of the first cell;

a time-integrating photodetector; and

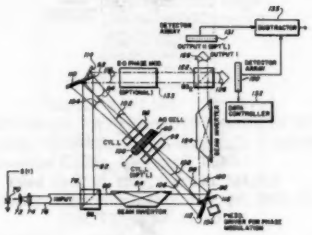
second dispersion means for dispersing along a second mutually orthogonal spatial dimension and bringing to focus at the time-integrating photodetector the diffracted light to produce a graph of the ambiguity plane wherein the colors identify the different Doppler components.

4,531,196

REAL-TIME FOURIER TRANSFORMER USING ONE ACOUSTO-OPTICAL CELL

Samuel S. Lin, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 27, 1983, Ser. No. 488,930
The portion of the term of this patent subsequent to Jul. 23, 2002, has been disclaimed.
Int. Cl.³ G06G *7/19*; G02F *1/11*
U.S. Cl. 364—827 **13 Claims**



1. A real-time optical Fourier transformer of a temporally varying signal, comprising:

an acousto-optical cell;

a control circuit for impressing a chirp signal upon the acousto-optical cell;

a light source for providing a beam of coherent light;

means for intensity modulating said coherent beam by the temporally varying signal;

a beam splitter for dividing said beam of coherent light into two incident beams;

optical means for directing said two incident beams onto opposing sides of the acousto-optical cell with the corresponding rays in said two incident beams passing through opposing ends of said acousto-optical cell, whereby both beams are at least partially diffracted into diffracted beams, the order of both diffracted beams being the same;

optical means for combining both diffracted beams with the corresponding rays of both diffracted beams becoming coincident; and

a time-integrating detector for measuring the integrated intensity of at least one point across the combined beam, whereby the spatial distribution of integrated intensities is related to the Fourier spectrum of said temporally varying signal.

4,531,197

REAL-TIME FOURIER TRANSFORMER USING ONE ACOUSTO-OPTICAL CELL

Samuel S. Lin, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 27, 1983, Ser. No. 488,924
Int. Cl.³ G06G *7/19*; G02F *1/11*
U.S. Cl. 364—827 **15 Claims**

1. An optical Fourier transformer of a temporally varying signal, comprising:

a source for providing a beam of coherent light;

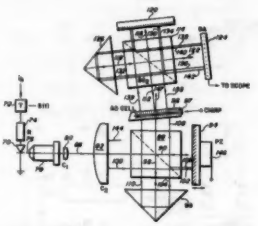
means for intensity-modulating said coherent light beam by a temporally varying signal to be transformed;

an acousto-optical cell;

a control circuit for impressing a chirp signal upon the acousto-optical cell;

a first beam splitter for dividing said coherent beam into two incident beams;

first optical means for directing said two incident beams onto one side of said acousto-optical cell with the corresponding rays of said two beams passing through opposite ends of said acousto-optical cell, whereby each beam incident upon said



acousto-optical cell produces a diffracted beam of the same order;

second optical means for recombining said two diffracted beams to form a recombined beam with corresponding rays being coincident; and

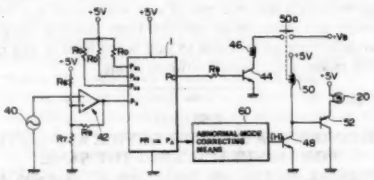
detecting means for integrating over time the intensity of at least one portion of said recombined beam, whereby said integrated intensity is related to the Fourier transform of the temporally varying signal.

4,531,198

OPERATION MODE MONITOR FOR MICROCOMPUTER

Toshiro Matsuda, Zama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 6, 1983, Ser. No. 482,564
Claims priority, application Japan, May 19, 1982, 57-83231
Int. Cl.³ G06F *11/30*
U.S. Cl. 364—900 **19 Claims**



1. An operation mode monitor for a microcomputer in which any one of a plurality of operation modes can be selected in response to an operation mode setting signal generated from an external circuit whenever the microcomputer is initialized by an external reset circuit, which comprises:

(a) operation mode checking means for checking whether a correct operation mode has been selected in the microcomputer and for outputting an abnormal-operation-mode command signal in case an erroneous operation mode has been selected; and

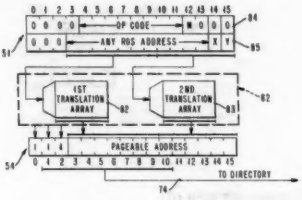
(b) abnormal-operation-mode correcting means responsive to said operation mode checking means for correcting an erroneously-selected operation mode to a correct operation mode in response to the abnormal-operation-mode command signal.

4,531,199

BINARY NUMBER SUBSTITUTION MECHANISM IN A CONTROL STORE ELEMENT

Raymond J. Pedersen, Garrison, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 269,146, Jun. 1, 1981, abandoned. This application Oct. 13, 1983, Ser. No. 541,819
Int. Cl.³ G06F *13/00, 7/28*
U.S. Cl. 364—900 **3 Claims**



1. A binary number substitution mechanism comprising:

first and second storage arrays comprised of 2^n n-bit storage locations and 2^p p-bit storage locations respectively, said first and second storage arrays each including access means for simultaneously addressing one of the 2^n storage locations of said first storage array and one of the 2^p storage locations of said second storage array, and a total of n+p read-out signal lines for data stored in the storage locations of said first and second storage arrays;

m input binary signal lines, said m input binary signal lines including an n-bit portion and a p-bit portion, the binary state of said m input binary signal lines being effective to represent 2^m binary numbers;

gate means, selectively and simultaneously interconnecting said n-bit portion of said m input binary signal lines to said access means of said first storage array and said p-bit portion of said input binary signal lines to said access means of said second storage array; and

enabling means having an output signal connected to said gate means, and connected to said m input binary signal lines and responsive to certain ones of said binary number representations of said m input binary signal lines, for enabling said gate means whereby a substitute binary number manifestation is read out of said first and second storage arrays on said n+p read-out signal lines.

4,531,200

INDEXED-INDIRECT ADDRESSING USING PREFIX CODES

Lawrence D. Whitley, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.J.

Filed Dec. 2, 1982, Ser. No. 446,132
Int. Cl.³ G06F *9/22, 9/00, 7/00*
U.S. Cl. 364—900 **19 Claims**

1. A method for addressing an instruction operand in a data processor having an addressable memory, comprising:

(a) fetching a token in an instruction stream;

(b) if said token represents a predetermined prefix code,

(1) incrementing a count, and

(2) repeating step (a);

(c) if said token represents an instruction, determining an operand address at least partly specified by said instruction;

(d) if said count is nonzero,

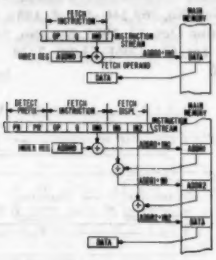
(1) fetching a memory word at said operand address,

(2) fetching a suffix value,

(3) modifying said memory word in accordance with said

suffix value so as to substitute a further address for said operand address,

(4) decrementing said count, and



(5) repeating step (d);

(e) fetching an operand for said instruction in accordance with said operand address.

4,531,201

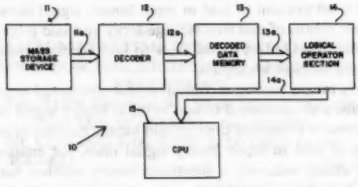
TEXT COMPARATOR

James T. Skinner, Jr., 780 Yale Rd., Boulder, Colo. 80303

Filed Jan. 25, 1982, Ser. No. 342,620

Int. Cl.³ G06F *7/04*

U.S. Cl. 364—900 **14 Claims**



1. A textual comparison system for locating desired character strings within textual material formed from a predefined sequence of characters comprising:

means for sequentially receiving a plurality of stored textual characters;

means for sequentially decoding said plurality of stored textual characters, thereby providing a sequence of decoded characters, said means for decoding said stored textual characters having a plurality of N output leads, where N is an integer equal to the number of unique textual characters which are to be decoded; each said N output leads being uniquely associated with one of said textual characters to be decoded, where the unique one of said N output leads associated with the specific character being decoded provides a signal when the textual character associated with said output lead has been decoded;

means for storing said decoded characters and information as to the relative positioning of said decoded characters within said predefined sequence of characters;

means for comparing said decoded characters and said information as to the relative positioning of said decoded characters with information defining said desired character strings, whereby the presence of desired character strings is determined; and

means for providing a signal indicating that a desired character string has been located.

4,531,202

SEMICONDUCTOR NONVOLATILE READ ONLY MEMORY DEVICE

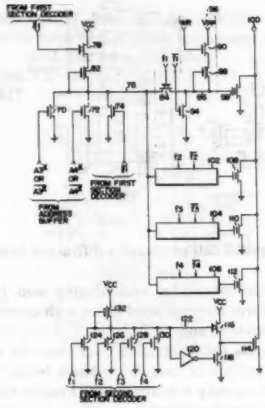
Shigeyoshi Watanabe, and Sumio Tanaka, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jan. 29, 1982, Ser. No. 344,049

Claims priority, application Japan, Feb. 5, 1981, 56-14985

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—104 **8 Claims**



1. A semiconductor nonvolatile read only memory device comprising:

semiconductor nonvolatile memory transistors, a reference voltage being applied to the sources of said transistors;

word lines connected to the gates of said transistors,

output lines connected to the drains (or sources) of said transistors; and

voltage applying means connected to said word lines for applying said reference voltage to said word lines in a stand-by mode, and applying a readout voltage to only selected one of said word lines in a readout mode;

write-in voltage terminal; and

writing means connected between said write-in voltage terminal and said word lines for applying a write-in voltage to only a selected one of said word lines in a write-in mode and preventing current from flowing from said write-in voltage terminal to said word lines in any operation mode other than a write-in mode.

4,531,203

SEMICONDUCTOR MEMORY DEVICE AND METHOD FOR MANUFACTURING THE SAME

Fujio Masuoka, and Hisakazu Iizuka, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 13, 1981, Ser. No. 320,936

Claims priority, application Japan, Dec. 20, 1980, 55/180941; Dec. 20, 1980, 55/180952

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—218 **4 Claims**

1. A semiconductor memory device with a plurality of memory cells arranged in a matrix form, each of said memory cells comprising:

a semiconductor region of a first conductivity type;

source and drain regions of a second conductivity type formed in said semiconductor region;

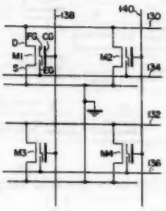
a gate insulation film formed on a part of said semiconductor region between said source and drain regions;

a field insulation film formed on said semiconductor region for separating said memory cells from each other;

an erase gate formed on said field insulation film;

a floating gate formed on said gate insulation film, a portion of said floating gate overlapping a part of said erase gate with a first insulating film being interposed between said floating gate and said erase gate; and

a control gate formed over said floating gate with a second insulating film being interposed between said control gate



and said floating gate and said control gate being formed on said erase gate with a third insulating film being interposed between said control gate and said erase gate, said control gate thereby being insulated from said erase gate and said floating gate and overlapping the portion of said floating gate overlapping said part of said erase gate, said third insulating film being thicker than said first insulating film.

4,531,204

COMPUTERIZED TRUCK INSTRUMENTATION SYSTEM

David J. Vanderschel, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 944,462, Sep. 21, 1978, abandoned, which is a continuation of Ser. No. 356,233, May 1, 1973, abandoned. This application Aug. 18, 1980, Ser. No. 178,859

Claims priority, application United Kingdom, May 4, 1972, 20846/72

Int. Cl.³ G01V *1/40, 1/24*

U.S. Cl. 367—25 **20 Claims**

1. A method of acquiring and processing well logging data which are representative of measurements provided by a well logging tool adapted for investigating characteristics of earth formations around a well bore comprising the steps of:

moving a well logging tool through a well bore;

supporting a measuring means with said well logging tool;

acquiring well logging data relating to a selection of well bore characteristics with said measuring means;

providing selected electrical outputs from said measuring means representative of said acquired data;

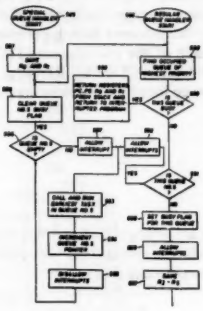
receiving and processing said acquired well logging data according to selected sequences of processing steps for each of said selected well bore characteristics, each of said selected sequences having a selected priority level, and wherein processing a first one of said acquired well logging data is in response to the receipt of a first selected electrical output representative of the occurrence of a first selected event and according to a first one of said selected sequences of processing steps associated with said first selected event; and

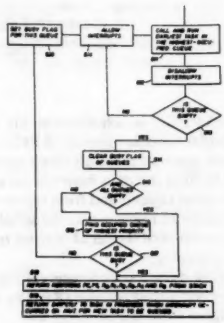
controlling said receiving and processing in response to said selected electrical outputs such that said selected sequences of processing steps is appropriate for the well bore characteristics represented by said acquired well logging data, said controlling and processing including the steps of:

receiving a second selected electrical output upon the occurrence of a second selected event, said second event indicative of additional required processing of well logging data,

stopping said processing of said first one of said acquired well logging data in response to receiving said second selected electrical output, and storing information relating to the processing of data according to said first sequence of steps,

providing information relating to said second event in response to said received second selected electrical output, including the identification of the required sequence of processing steps necessary for said additional required processing and the selected priority level of said required sequence of steps,





comparing said selected priority level of said first sequence and said required sequence of steps according to a third sequence of steps for determining an execution order for said required sequence and said first sequence, and

processing of said well logging data according to said required sequence and said first sequence as determined by said execution order, said processing including retrieving, said stored information and resuming processing of said first well logging data according to said first sequence of steps.

4,531,205

OPTOELECTRONIC METHOD OF READING DATA ON A MAGNETIC MEDIUM AND CIRCUIT FOR PERFORMING SAID METHOD

Philippe Faugeras, Boulogne, France, assignor to Cii Honeywell Bull (Societe Anonyme), Paris, France

Filed Apr. 29, 1983, Ser. No. 490,127

Claims priority, application France, May 14, 1982, 82 08406

Int. Cl.³ G11B *11/10*

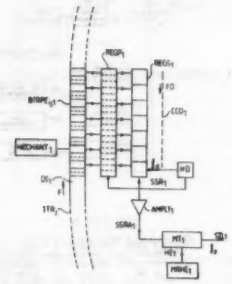
U.S. Cl. 369—13 **5 Claims**

2. A circuit for reading the data retained on a magnetic medium (SM) within a plurality of tracks, the data being received in the form of a plurality of luminous spots which are

provided by an optical device which observes simultaneously a plurality of tracks and a plurality of data on each track of the magnetic medium (SM) so as to project an enlarged image in the form of a group of such spots onto a plane (P) where there are arranged a plurality of photoelectronic transducers ($TRPE_{ij}$) aligned in at least one row ($BTRPE_{ij1}$, $BTRPE_{ij2}$), and whose output signal is a function of the luminous intensity of said spots, characterized in that, at least two photoelectronic transducers ($TRPE_{ij}$, $TRPE_{(i+1)j}$) are associated with a luminous spot (ID_j) and the circuit comprises:

a parallel transfer register ($REGP_1$, $REGP_2$) containing at least as many storage locations as the row contains photoelectronic transducers which receives the signals generated by each of the transducers ($TRPE_{ij}$);

a serial shift register ($REGS_1$, $REGS_2$) containing at least as many storage locations as there are photoelectronic transducers ($TRPE_{ij}$) which receives the data transmitted by said parallel transfer register ($REGP_1$, $REGP_2$);



a shift clock generating a shift clock signal with a frequency (f_d) for shifting the data from the pa. allel transfer register into the serial register and from one storage location of the parallel transfer register into the serial register and from a storage location of the serial register to the location immediately adjoining;

an amplifying device which receives the signal (SSR_1) generated by serial shift register ($REGS_1$, $REGS_2$) and generates a signal ($SSRA_1$, $SSRA_2$); and

means for converting the signal ($SSRA_1$) generated by the amplifying device ($AMPLI_1$, $AMPLI_2$) into a logical signal with generated logic bits of data at a frequency equal to the writing frequency (f_E) of the data on the data medium (SM).

4,531,206

METHOD AND APPARATUS FOR DETECTING TRACKING ERROR

Kenji Kimura, Tachikawa, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Apr. 5, 1982, Ser. No. 365,310

Claims priority, application Japan, Apr. 10, 1981, 56-53119

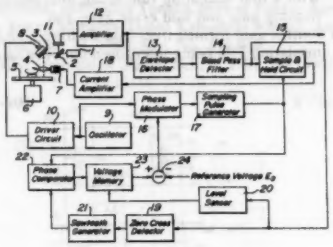
Int. Cl.³ G11B *21/02*; H04N *5/76*

U.S. Cl. 369—44 **10 Claims**

1. In a method for detecting a tracking error produced by the deviation of a light beam projected upon a rotating optical disc with respect to spiral or concentric information tracks recorded in the optical disc, wherein the light beam is caused to vibrate on the optical disc in a disc radial direction by a first signal and wherein a second signal derived from light projected on said disc is sampled at a predetermined phase position of said second signal by a sampling signal synchronized with said first signal to obtain a tracking error signal, the improvement in said method of detecting a tracking error comprising:

detecting a phase difference between the sampling signal and the second signal; and

changing the phase of the sampling signal in response to said detected phase difference to maintain a predetermined phase relationship between said sampling signal and said second signal.



4,531,207

RECORD CUTTING STYLUS ASSEMBLY

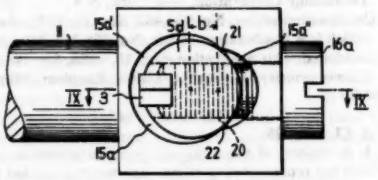
Horst Redlich, and Heinz Stahlbaum, both of Berlin, Fed. Rep. of Germany, assignors to TELDEC Schallplatten GmbH, Hamburg, Fed. Rep. of Germany

Filed Oct. 13, 1983, Ser. No. 541,661

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1982, 3237908

Int. Cl.³ G11B *3/50*

U.S. Cl. 369—173 **8 Claims**



1. A stylus assembly, in combination with a cutting head, for cutting information in a recording medium, comprising

(a) a mount including a bar having

(1) a length dimension;

(2) means defining a groove extending in a face of said bar generally parallel to said length dimension and having an open top face;

(3) means defining a threaded bore extending perpendicularly to said length dimension;

(b) a stylus having a leading face; said stylus being received in said groove such that said leading face is oriented substantially 180° away from said open top face of said groove and slightly projects therebeyond in its entirety; said leading face being oriented perpendicularly to said bore; said mount and said stylus forming said stylus assembly;

(c) means defining a socket opening forming part of said cutting head; said socket opening receiving said stylus assembly;

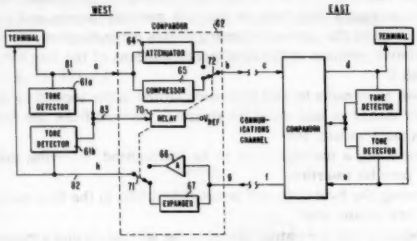
(d) means defining two parallel engagement edges within said socket opening; and

(e) a setscrew supported in said cutting head and projecting into said socket opening in a direction coinciding with a cutting direction; said setscrew threadedly engaging into said bore of said bar and pulling said bar into a pressing contact with said engagement edges within said socket opening.

4,531,208
APPARATUS AND METHOD FOR REDUCING TELEPHONE CHANNEL POWER LOADING

Gerald S. Kaplan, Princeton, and Russell G. Setzer, Hazlet, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Feb. 24, 1982, Ser. No. 351,999
Int. Cl.³ H04B 1/00; H04J 3/18
U.S. Cl. 370—7 5 Claims



1. In a communications system used for the transmission of signals between two terminals via a communications channel, wherein a supervisory signal of predetermined frequency and predetermined power level is transmitted by each of said terminals into said communications channel when said terminal is idle, an apparatus for reducing the power loading in said system due to said supervisory signals comprising:

means individually associated with each of said two terminals for providing a control signal in response to said supervisory signal transmitted by said associated terminal into said communications channel or received by said associated terminal from said communications channel; and

means responsive to a first level of said control signal for compressing the signal transmitted by said associated terminal into said communications channel and expanding the signal received by said associated terminal from said communications channel, wherein the power ratios of said compression and said expansion are related to said transmitted signal and said received signal, respectively, and responsive to a second level of said control signal for attenuating the signal transmitted by said associated terminal into said communications channel by a predetermined power ratio and amplifying the signal received by said associated terminal from said communications channel by the predetermined power ratio of said attenuation.

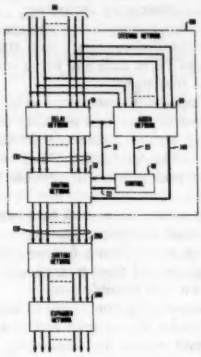
4,531,209
SELF-ROUTING STEERING NETWORK

Scott C. Knauer, Englishtown, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 28, 1983, Ser. No. 479,797
Int. Cl.³ H04Q 11/00, 11/04
U.S. Cl. 370—56 18 Claims

1. A steering network having a plurality of input ports and output ports, for routing the signals on active ones of said input ports comprising:

first means responsive to signal activity on said input ports for simultaneously computing binary numbers indicative of the necessary steering of said signals on said active signal ports; and

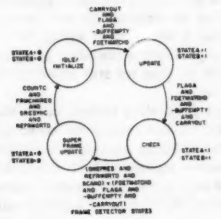


second means, connected to said input ports and responsive to said first means, for steering said signals on said active signal ports to adjacent ones of said output ports.

4,531,210
DIGITAL SPAN REFRAMING CIRCUIT

Thomas J. Perry, Phoenix, Ariz., assignor to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Jun. 22, 1983, Ser. No. 506,758
Int. Cl.³ H04T 3/06
U.S. Cl. 370—100 7 Claims



1. In a telecommunications switching system having a switching network, a plurality of digital spans being connected to said switching network and each said digital span asynchronously transmitting PCM data to said switching network, a digital span reframing circuit connected between each said digital span and said switching network for reframing and resynchronizing any of said plurality of digital spans in response to a reframe grant signal and a reframe status of each digital span, said digital span reframing circuit comprising:

said reframe status indicating at least one particular digital span requiring reframing and resynchronization;

memory means connected to each of said digital spans and being operated in response to said reframe grant signal and said reframe status of said particular digital span to cyclically store a predefined amount of said PCM data from said one particular digital span and to store still possible bits for each bit of said PCM data;

said memory means including:

first flip-flop means connected to said particular digital span;

multiplexer means connected to said first flip-flop means; and

random access memory means connected to said multiplexer means;

means for comparing said still possible bits with received PCM data, said means for comparing connected to said memory means and being operated to generate a reset bit for each equality of said received PCM data with

said still possible bits or alternatively to generate a set bit for each inequality of said received PCM data with said still possible bits;

said means for comparing including:

first gating means connected to said random access memory means for "exclusive-oring" said still possible bits with said received PCM data and being operated to produce a plurality of first signals;

second flip-flop means connected to said first gating means and operated to store said plurality of first signals;

second gating means connected to said second flip-flop means and being operated to "and" said plurality of first signals with said stored still possible bits of said memory means; and

third flip-flop means connected between said second gating means and said multiplexer means;

said memory means being further operated to store said generated set and reset bits, of said means for comparing, as new still possible bits;

means for sequencing connected to said memory means, to said particular digital span and to said means for comparing, said means for sequencing being operated to cyclically operate said memory means and said means for comparing for a predetermined time interval;

said means for sequencing including:

a programming logic array;

first counter means connected to said programming logic array; and

fourth flip-flop means connected to said programming logic array and to said third flip-flop means;

said means for sequencing and said memory means being cyclically connected to each said digital span of said plurality having said reframe status indicating reframing and resynchronization is required;

means for detecting connected to said memory means and to said means for sequencing, said means for detecting operated in response to said new still possible bits to generate a one present signal for a set still possible bit and to generate a plurality of signals representing the position of said set still possible bit within said PCM data; and

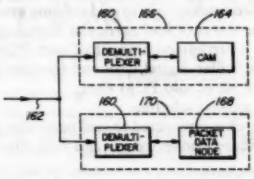
means for generating connected to said means for detecting and to said means for sequencing, said means for generating being operated in response to said plurality of position signals of said means for detecting to produce a new write vector signal representing a pointer to the initial PCM data of a first frame for reframing and resynchronizing said particular digital span.

4,531,211

MULTIPLEXER FOR BIT ORIENTED PROTOCOL DATA LINK CONTROL

Faruk Hadziomerovic, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Feb. 21, 1984, Ser. No. 581,808
Claims priority, application Canada, Dec. 23, 1983, 444271
Int. Cl.³ H04J *3/06, 3/04*
U.S. Cl. 370—102 **12 Claims**



1. Apparatus for transmitting messages from a plurality of channels in a time division multiplexed serial bit stream using bit oriented protocol frames, each frame comprising at least an opening flag byte and a plurality of message bytes comprising bytes of a message of a respective channel to be transmitted, the flag byte comprising a sequence of a predetermined number of consecutive 1 bits and the bits of the message bytes being subject to zero bit insertion whereby occurrence of the flag byte within the message is avoided, the apparatus comprising:

first and second memory means;

means for deriving said serial bit stream from the first memory means;

means responsive to a message of a channel to be transmitted for storing a flag byte in the first memory means and for storing in the second memory means an indication of the relative position in the first memory means of the flag byte; and

means, responsive to said indication stored in the second memory means as said serial bit stream is derived from the first memory means, for:

providing a message byte to be transmitted; effecting said zero bit insertion;

storing the byte with any inserted zero bits in the first memory means; and

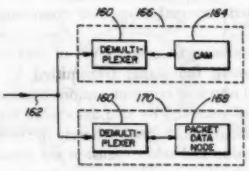
updating said indication stored in the second memory means in dependence upon the number of inserted zero bits.

4,531,212

DEMULTIPLEXER FOR BIT ORIENTED PROTOCOL DATA LINK CONTROL

Faruk Hadziomerovi , Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Feb. 21, 1984, Ser. No. 581,809
Claims priority, application Canada, Dec. 23, 1983, 444272
Int. Cl.³ H04J *3/06, 3/04*
U.S. Cl. 370—102 **11 Claims**



1. Apparatus for receiving messages for a plurality of channels from a time division multiplexed serial bit stream using bit oriented protocol frames, each frame comprising at least an opening flag byte and a plurality of message bytes including an initial address following said opening flag byte, the flag byte comprising a sequence of a predetermined number of consecutive 1 bits and the bits of the message bytes including inserted zero bits whereby occurrence of the flag byte within the message is avoided, the apparatus comprising:

first and second memory means;

means for storing said serial bit stream in the first memory means;

means responsive to the contents of the first memory means for detecting an opening flag byte of a channel together with a predetermined address code in the address of the channel following the opening flag byte, and in response to such detection for storing in the second memory means an indication of the relative position in the first memory means of the flag byte; and

means, responsive to said indication stored in the second memory means as said serial bit stream is stored in the first memory means, for:

deriving a message byte with any inserted zero bits from the first memory means;

removing any inserted zero bits from the message byte to produce a received message byte; and

updating said indication stored in the second memory

means in dependence upon the number of removed zero bits.

4,531,213

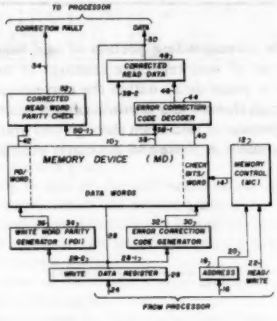
MEMORY THROUGH CHECKING SYSTEM WITH COMPARISON OF DATA WORD PARITY BEFORE AND AFTER ECC PROCESSING

James H. Scheuneman, St. Paul, Minn., assignor to Sperry Corporation, New York, N.Y.

Continuation of Ser. No. 354,340, Mar. 3, 1982, abandoned. This application Aug. 21, 1984, Ser. No. 643,086

Int. Cl.[3] G06F *11/08*

U.S. Cl. 371—3 4 Claims



1. For use in a digital data processing system having a memory system for addressably storing data words, each with associated check bits for use by error correction code circuitry, an error correction through check system comprising:

input means for receiving data words for recording at addressable storage locations in the memory system;

check bit generating means coupled to said data input means for generating check bit signals in a predetermined system in response to said data words, said check bit signals available for recording in the memory system along with associated ones of said data words, said check bit signals utilized for detecting and correcting errors in said data words when read out from the memory system;

data word parity generating means separate from said check bit generating means coupled to said data input means for generating a data word parity signal for each of said data words, where each of said data words is the same respectively as the associated one of said data words applied to said check bit generating means;

data word parity signal recording means coupled to said data word parity generating means for recording respective ones of said data word parity signals in the memory system together with associated ones of said data words and associated ones of said check bit signals, such that when a read data word and the associated ones of said check bit signals are read out of the memory system, the associated one of said data word parity signals will be read out therewith;

read out means for reading selected ones of said data words with associated ones of said check bit signals and the associated one of said data word parity signals from the memory system;

parity read out means for reading out said data word parity signals, each associated with respective ones of said selected ones of said read data words;

error detection and correction means coupled to said read out means and responsive to said read data words and associated one of said check bit signals for detecting errors in said read data words as read out and for correcting said errors that are correctable and for providing corrected read data words and for providing ones of said read data words that are correct at read out; and

through checking means separate from said error detection and correction means and coupled to said parity read out means and said error detection and correction means and responsive to said read data words after correction when correction is required or said read data words that are correct as read out, for generating a total read data parity signal for each of said corrected read data words and for comparing each of said total read data parity signals to the associated one of said data word parity signals read from the memory system for detecting malfunctions in the through check system and for providing error indicating signals when said malfunctions are detected.

4,531,214

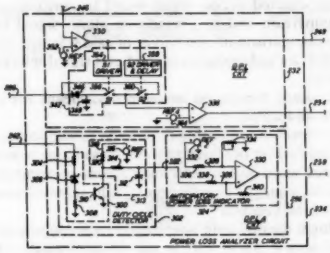
POWER LOSS ANALYZER CIRCUIT

John R. Torres, Somers, and Rocco V. Albano, Granby, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 24, 1983, Ser. No. 497,771

Int. Cl.[3] G11C *29/00*; G06F *11/00*

U.S. Cl. 371—66 9 Claims



1. Apparatus for providing, to an associated electronic signal processor of the type energized by a pulse width modulated (PWM) regulator with specified maximum duty cycle, a discrete power loss alert (DPLA) signal indicative of a disruption of the AC input power source to the PWM regulator, and for providing, in response to such power disruptions which reduce the processor's memory power supply output voltage to less than a minimum value, a discrete power loss (DPL) signal indicative of degradation of the memory's stored data resulting from such power disruption comprising:

DPLA circuit means, responsive to the PWM regulator output signal waveform for providing the DPLA signal in response to an actual duty cycle value greater than the specified maximum duty cycle; and

DPL circuit means, responsive to the lowest voltage value of the memory power supply occurring in the presence of a power disruption for comparing said lowest voltage value to a selected voltage value and for providing the DPL signal in response to said minimum voltage value being less than said selected value.

4,531,215
VALIDITY CHECKING ARRANGEMENT FOR EXTENDED MEMORY MAPPING OF EXTERNAL DEVICES

Chester T. Ladewski; Harry A. Chapman, and Jeffrey J. Johnston, all of Phoenix, Ariz., assignors to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Jun. 22, 1983, Ser. No. 506,565
Int. Cl.³ G06F *11/00*
U.S. Cl. 371—67 **6 Claims**

1. In a telecommunications switching system, a CPU accesses a plurality of external devices via a plurality of unit signals in a memory mapped access, a validity checking arrangement for determining said CPU access to invalid ones of said plurality of external devices, said validity checking arrangement comprising:

changeable memory means being connected to said CPU for dynamically storing words representing an access status for each of said plurality of external devices, said changeable memory means being operated to store said words;

said access status word including identical half words for each valid external device;

said access status word including non-identical half words of a predefined value for each invalid external device;

said changeable memory means being further operated in response to said unit signal of said CPU, representing a particular device access, to read out and to transmit one selected access status word of said plurality of status words;

means for comparing connected to said changeable memory means and to said CPU and being operated in response to said selected access status word to perform a bit-for-bit comparison and to provide an alarm signal for any bit miscomparison of said halves of aaid selected access status word, for indicating an invalid unit signal selection by said CPU;

logic means connected between said means for comparing and said CPU;

said means for comparing connected to said logic means and being further operated to transmit said one selected access status word half to said logic means in response to a bit-for-bit equality comparison of said selected access status word halves; and

said logic means being operated in response to said transmitted access status half words to configure said external devices and to transmit a ready signal to said CPU.

4,531,216
AZIMUTHALLY POLARIZED BEAM QUALITY IMPROVEMENT SYSTEM

Glenn A. Tyler, Mission Viejo, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 14, 1981, Ser. No. 263,450
Int. Cl.³ H01S *3/10*
U.S. Cl. 372—9 **13 Claims**

1. An apparatus for converting an azimuthally polarized beam into a circularly polarized beam, comprising a plurality of mirrors, each mirror comprising a substrate and a plurality of reflective coatings applied to said substrate in angular sections, said mirrors positioned so that said azimuthally polarized beam strikes said mirror in succession and so that a respective portion of said azimuthally polarized beam striking an angular section of a first mirror strikes a corresponding angular section of a succeeding mirror, said corresponding angular sections forming aligned sets of angular sections, at least one of said reflective coatings of each aligned set providing a phase shift

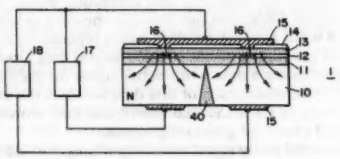
SEGMENT CENTERED AT ANGLE (DEGREES)	FIRST MIRROR 36		SECOND MIRROR 38	
	PHASE DELAY, ϕ	PHASE SHIFT	PHASE DELAY, ϕ	PHASE SHIFT
0	$-\frac{\pi}{4}$			$\frac{\pi}{4}$
45		$\frac{\pi}{4}$	0	
90	$\frac{\pi}{4}$			$-\frac{\pi}{4}$
135		$-\frac{\pi}{4}$	0	
180	$\frac{3\pi}{4}$			$\frac{\pi}{4}$
225		$\frac{\pi}{4}$	0	
270	$-\frac{3\pi}{4}$			$-\frac{\pi}{4}$
315		$-\frac{\pi}{4}$	0	

within the corresponding portion of said beam, and at least another one of said reflective coatings of each aligned set providing a phase delay within the corresponding portion of said beam so that all said portions of said beam upon completion of a passage of said beam through said plurality of mirrors are substantially in phase and circularly polarized in the same direction.

4,531,217
SEMICONDUCTOR LASER DEVICE WITH PLURAL LIGHT SOURCES

Takashi Kitamura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 326,268, Dec. 1, 1981, abandoned. This application Apr. 12, 1984, Ser. No. 599,205
Claims priority, application Japan, Dec. 8, 1980, 55-172976
Int. Cl.³ H01S *3/19*
U.S. Cl. 372—50 **7 Claims**



1. In a semiconductor laser device having a plurality of light sources, the improvement comprising:

a substrate including an N-type semiconductor;

a plurality of layers on one surface of said substrate;

a plurality of electrodes on the other surface of said substrate;

a plurality of light-emitting points in one of said plurality of layers and each corresponding to one of said plurality of electrodes;

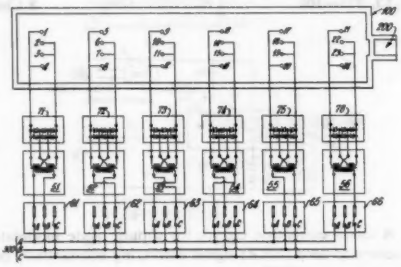
a common electrode on a surface of said plurality of layers farthest from said substrate and corresponding to said plurality of electrodes; and

grooves each of which is in said substrate between adjacent ones of said plurality of electrodes.

4,531,218
GLASS MELTING FURNACE

Michael Williamson, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jun. 17, 1983, Ser. No. 505,546
Int. Cl.[3] C03B 5/02
U.S. Cl. 373—39 9 Claims



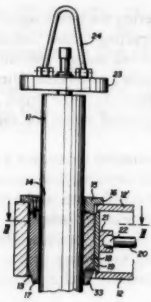
1. An electric resistance heated glass producing furnace comprising:
(a) a receptacle having at least side and bottom walls to contain the molten glass;
(b) an opening in one of the side walls at the end of the receptacle to withdraw the molten glass;
(c) four electrodes spaced uniformly across the receptacle to form a row of electrodes which electrically conductively engage the molten glass;
(d) multiple rows of electrodes spaced uniformly along the length of the receptacle;
(e) a fused switch bank for each row of electrodes to receive the incoming power;
(f) a power transformer having primary and secondary windings for each row of electrodes, said power transformer primary windings connected to the switch bank;
(g) a current limiting controller for each row of electrodes, said controller having two input connections and a first and a second output connection, said input connections connected to the secondary windings of the power transformer; and
(h) said four electrodes grouped into two electrode pairs within a given row of electrodes, the first of said pair of electrodes connected together to said first output of the controller and the second pair of said electrodes connected together to said second output of the controller such that the current flow in the molten glass can only be between adjacent electrodes within a row of electrodes.

4,531,219
ELECTRODE ASSEMBLY FOR ARC FURNACES

Dieter Zöllner; Inge Lauterbach-Dammler, both of Nuremberg; Thomas Taube, Erlangen; Hans Lades, Schwaig; Siegfried Liebel, Röthenbach, and Hanns-Georg Bauer, Witten, all of Fed. Rep. of Germany, assignors to ARC Technologies Systems Ltd., Cayman Islands

Filed Aug. 1, 1983, Ser. No. 519,045
Claims priority, application Switzerland, Aug. 26, 1982, 5069/82
Int. Cl.[3] H05B 7/101
U.S. Cl. 373—101 10 Claims

1. An electrode assembly for arc furnaces comprising:
(a) an electrode shaft;
(b) clamping means surrounding said electrode shaft but spaced apart therefrom, said clamping means being positioned around a portion of the length of said shaft, with said clamping means including a clamping jaw configured for application of radial pressure;
(c) spacing means around the circumference of said shaft, arranged between the electrode shaft and the clamping means, said spacing means comprising spacer segments having lateral openings between adjacent segments; and
(d) electrically conductive contact elements, radially movable for contact with said electrode shaft, arranged within

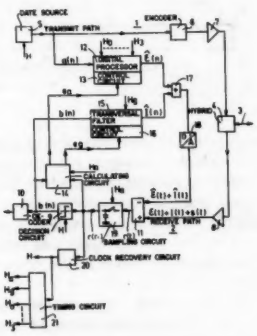


said lateral openings and at least in part in contact with said clamping jaw;
whereby application of radial pressure from said clamping jaw upon said contact elements presses said elements, and clamps said elements against said electrode shaft.

4,531,220
RECEIVER FOR A DATA TRANSMISSION MODEM, COMPRISING AN ECHO CANCELLER AND AN EQUALIZER

Richard Brie, Paris, and Loïc B. Y. Guidoux, Garancieres, both of France, assignors to Telecommunications Radioelectriques et Telephoniques, Paris, France

Filed Oct. 17, 1983, Ser. No. 542,837
Claims priority, application France, Oct. 15, 1982, 82 17289
Int. Cl.[3] H04B 15/02
U.S. Cl. 375—14 3 Claims



1. A receiver used in a data transmission modem having a receive path containing a baseband signal and clock signal, and a transmit path, comprising:
an echo canceller incorporating an adjustable processor, said processor including a transversal filter connected to said transmit path for generating a synthetic echo signal;
a decision circuit connected to remove a data signal from said receive path;
a self-adaptive equalizer for receiving the data signal recovered by the decision circuit, said equalizer including a transversal filter;
a subtracting means for subtracting signals generated by the

canceller and equalizer from said baseband signal in said receive path;

means for sampling a signal produced by said subtracting means at a sampling rate which satisfies the Shannon criteria with respect to a transmit signal in said transmit path;

means for recovering the clock signal in said baseband signal from said subtracting means output signal;

means for generating second and third clocking signals for said echo canceller transversal filter and said self-adaptive equalizer transversal filter from said recovered clock signal, and a control signal for said means for sampling; and

circuit means connected to receive a signal from said means for sampling for deriving first and second error signals for controlling the coefficients of the transversal filters of said echo canceller and self-adaptive equalizer, whereby a synthetic echo signal is generated from said echo canceller at said sampling frequency, and a synthetic interference signal is generated by said equalizer.

4,531,221

PREMODULATION FILTER FOR GENERATING A GENERALIZED TAMED FREQUENCY MODULATED SIGNAL

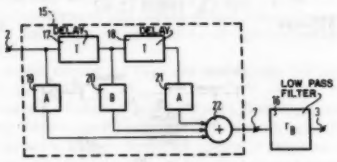
Kah-Seng Chung, and Leo E. Zegers, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 24, 1983, Ser. No. 478,397

Claims priority, application Netherlands, Apr. 13, 1982, 8201533

Int. Cl.³ H04B *3/14*

U.S. Cl. 375—60 **2 Claims**



1. In a system of frequency modulating a carrier signal with a data signal, which data signal has five signal levels when sampled at sampling instants $t=nT$, where T is the bit period of said data signal, and n is the number of bits of said data signal, a premodulation filter, to which are incoming data signal to be transmitted is applied, for supplying said data signal, said data signal now having three signal levels when sampled at sampling instants $(2m-1)T/2$, where m is an integer, comprising:

a non-recursive second order digital filter connected to receive said incoming data signal and providing first and second delayed signals, means for multiplying said first signal by a factor A, and said second signal by a factor B, where B lies between a value of 0.54 and 0.66, and wherein $2A+B=1$, means for multiplying said incoming data signal by a factor A forming a third signal, and means for combining said third signal with said multiplied first and second signals to provide an oupput signal; and

a lowpass filter which satisfies the third Nyquist criterion realized by means of a raised cosine filter satisfying the first Nyquist criterion having a roll-off coefficient, rb, between 0.2 and 0.42, said lowpass filter receiving said output signal from said digital filter and supplying said data signal.

4,531,222

CLOCK EXTRACTION CIRCUIT FOR A PCM SIGNAL

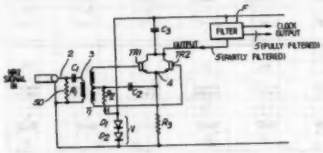
Basil B. Foster, London, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jul. 15, 1983, Ser. No. 514,064

Claims priority, application United Kingdom, Jul. 29, 1982, 8221908

Int. Cl.³ H04L *7/04*

U.S. Cl. 375—106 **8 Claims**



1. A clock extraction circuit for a pulse code modulation non-return-to-zero (NRZ) signal delivering substantially constant power, said NRZ signal containing clock pulse information which information undesirably varies over a wide range of amplitudes, comprising:

a transformer having a primary winding adapted to receive said NRZ signal, said transformer having a secondary winding with said secondary winding having first and second output terminals and a center tap, and means coupled to said transformer to provide a differentiated version of said NRZ signal at said first and second output terminals,

first and second transistors each having a base, emitter and collector electrodes, with the collector electrodes of said transistors connected together to provide an output terminal, with the emitter electrodes of said transistors connected together and directed to a point of reference potential via a current limiting resistor, with the base electrode of said first transistor directly connected to said first output terminal of said secondary winding, and with the base electrode of said second transistor directly connected to said second output terminal of said secondary winding, a first storage capacitor coupled between said center tap and the common connection of said emitter electrodes to provide a charge proportional to the time between said clock pulses, a second storage capacitor coupled between the common connection of said collector electrodes and said center tap, with said center tap directed to said point of reference potential via a current source, and with said collector output terminal coupled to the input of a filter to allow said second storage capacitor to mainly discharge through said filter to provide a substantially constant power replica of said clock pulse information contained in said NRZ signal.

4,531,223

CLOCK DERIVATION CIRCUITS

Akira Ashida, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 18, 1980, Ser. No. 131,446

Claims priority, application Japan, Mar. 20, 1979, 54-31801

Int. Cl.³ H04L *7/00;* **H03K** *5/156*

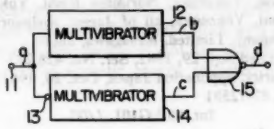
U.S. Cl. 375—110 **6 Claims**

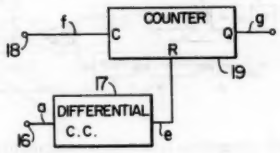
1. A clock signal deriving method for deriving clock information from an input data signal encoded by a Manchester code or the like having a base band of twice the clock frequency, comprising the steps of:

producing data signal change signals indicative of data value changes in the input signal from one binary value to the other by

(a) detecting the rise and fall of the base band input data signal; and

(b) detecting that no rise or fall in the input data signal has occurred for a time ranging from $\frac{1}{4}$ of a data time slot to





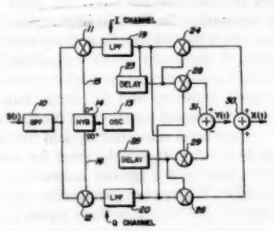
one data time slot after a respective rise or fall has been detected.

4,531,224

LOW SIGNAL-TO-NOISE RATIO SYMBOL SYNCHRONIZER

Ronald D. McCallister, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 23, 1983, Ser. No. 507,193
Int. Cl.³ H03D *3/06;* **H04L** *7/02*
U.S. Cl. 375—110 **9 Claims**



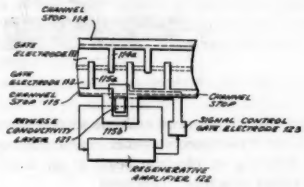
1. Apparatus for use in a digital data receiver comprising:
means for forming first and second quadrature signals from an input signal;
means for forming delayed and undelayed versions of said first and second quadrature signals;
means for multiplying said undelayed version of said first signal with said delayed version of said first signal to produce a first product;
means for multiplying said undelayed version of said second signal with said delayed version of said second signal to produce a second product;
means for multiplying said undelayed version of said second signal with said delayed version of said first signal to produce a third product;
means for multiplying said undelayed version of said first signal with said delayed version of said second signal to produce a fourth product; and
means for combining said first, second, third and fourth products to produce at least one signal indicative of a characteristic of said input signal.

4,531,225

CHARGE COUPLED DEVICE WITH MEANDER CHANNEL AND ELONGATED, STRAIGHT, PARALLEL GATE ELECTRODE

Osamu Ohtsuki, Kobe, Japan, assignor to Fujitju Limited, Kawasaki, Japan

Continuation of Ser. No. 887,655, Mar. 17, 1978, abandoned, which is a continuation-in-part of Ser. No. 735,639, Oct. 26, 1976, abandoned. This application Dec. 18, 1981, Ser. No. 332,241
Claims priority, application Japan, Oct. 31, 1975, 50-131941; Dec. 24, 1975, 50-153232; Dec. 29, 1975, 50-156876
Int. Cl.³ G11C *19/28;* **H01L** *29/78;* **H03H** *15/02*
U.S. Cl. 377—58 **3 Claims**

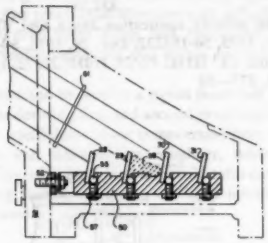


2. A charge coupled device, comprising
a semiconductor substrate of predetermined conductivity type, said substrate having a surface;
a pair of substantially band-shaped channel stops formed on the substrate surface and extending in spaced substantially parallel relation, said channel stops comprising a high impurity concentration layer of the predetermined conductivity type formed on said substrate surface;
a charge transfer area bounded by the band-shaped channel stops, said charge transfer area having sides;
a plurality of short channel stops alternately extending from each of the band-shaped channel stops toward the center of the charge transfer area, each of the short channel stops terminating at a predetermined space from the opposing band-shaped channel stop, the short channel stops comprising the high impurity concentration layer of the predetermined conductivity type formed on said substrate surface in an interdigitated pattern with the channel stops;
a plurality of cells each comprising a small area between next-adjacent short channel stops of a corresponding one of the band-shaped channel stops, said cells being staggered along said charge coupled device;
means for forming an asymmetrical depletion layer in each of said cells in a regular arrangement to determine a transfer direction of the charge;
a film of electrically insulative material covering the charge transfer area;
a pair of elongated parallel gate electrodes over said insulative film, one of said gate electrodes commonly covering the cells of one of the band-shaped channel stops and the other of said gate electrodes commonly covering the cells of the other of the band-shaped channel stops thereby forming a single directional meander-shaped charge transfer channel in the charge transfer area under said pair of gate electrodes;
at least one projecting portion extending from the channel stops at a side of the charge transfer area;
signal input and output means in the projecting portion or portions; and
regenerative amplifier means for amplifying an extracted signal charge and returning the amplified signal charge to the projecting portion.

4,531,226
MULTIPLE ELECTRON BEAM TARGET FOR USE IN X-RAY SCANNER

Kristian R. Peschmann, San Francisco, Calif., assignor to Imatron Associates, South San Francisco, Calif.

Filed Mar. 17, 1983, Ser. No. 476,425
Int. Cl.³ H01J *1/00, 35/08*
U.S. Cl. 378—143 **8 Claims**



1. For use in a high speed multiple section computed-tomographic X-ray transmission scanner in which X-rays are generated by directing an electron beam at an X-ray generating target, a target structure comprising

a heat conducting support bracket having a support surface orientated at a selected angle with respect to the axis of an electron beam, said support bracket including a recessed portion and said support surface being formed in said recessed portion,

a target member positioned in said recessed portion and having a substantially planar surface in engagement with said support surface, and

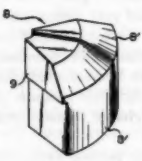
clamp means for maintaining said target member in engagement with said support surface, said clamp means including a bolt attached to said support bracket and extending into said recessed portion and spaced from said support surface for pushing said surface of said target member in pressure engagement with said support surface.

5. A target structure as defined by claim 1 wherein said target member comprises solid tungsten.

4,531,227
ROTARY ANODE FOR X-RAY TUBE

Yoshio Fukuhara, Yokohama, and Hideo Koizumi, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 23, 1982, Ser. No. 422,178
Claims priority, application Japan, Sep. 30, 1981, 56-155498
Int. Cl.³ H01J *35/10*
U.S. Cl. 378—144 **8 Claims**

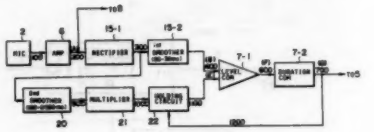


1. A rotary anode for an X-ray tube, comprising a graphite body which has a plurality of radial slits, and a target layer adhered on an upper surface of said graphite body, wherein each of said plurality of slits has a width of about 0.5 to 3 mm.

4,531,228
SPEECH RECOGNITION SYSTEM FOR AN AUTOMOTIVE VEHICLE

Kazunori Noso, Yokosuka; Norimasa Kishi, Yokohama, and Toru Futami, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Sep. 29, 1982, Ser. No. 428,233
Claims priority, application Japan, Oct. 20, 1981, 56-166460; May 1, 1982, 57-72591
Int. Cl.³ G10L *1/00*
U.S. Cl. 381—46 **14 Claims**



1. A speech recognition system for an automotive vehicle for activating an actuator in response to a spoken instruction inputted through a microphone which comprises:

(a) first smoothing means for smoothing the spoken instruction signal inputted through the microphone;

(b) second smoothing means for smoothing the spoken instruction signal inputted through the microphone, said second smoothing means having a time constant longer than that of said first smoothing means;

(c) signal level increasing means for increasing the spoken instruction signal voltage level smoothed by said second smoothing means;

(d) threshold level outputting means for outputting a first threshold level for detecting the start of the spoken instruction and a second threshold level for detecting the end of spoken instruction in dependence upon the signal voltage level increased by said signal level increasing means, the second threshold level being equal to or higher than the first threshold level;

(e) means for comparing the spoken instruction signal voltage level smoothed by said first smoothing means with the first and second threshold levels outputted from said threshold level outputting means with respect to voltage level and signal duration, and for outputting a spoken instruction start command signal when the spoken instruction signal voltage level smoothed by said first smoothing means exceeds the first threshold level for more than a reference start time and a spoken instruction end command signal when the spoken instruction signal voltage level smoothed by said first smoothing means drops below the second threshold level for more than a reference end time; and

(f) a speech recognizer for starting recognizing the spoken instruction signal inputted through the microphone in response to the start command signal and stopping recognizing the same signal in response to the end command signal.

4,531,229
METHOD AND APPARATUS FOR IMPROVING BINAURAL HEARING

David C. Coulter, Vienna, Va., assignor to Coulter Associates, Inc., Vienna, Va.

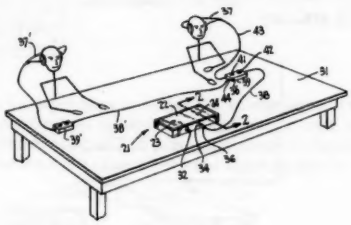
Filed Oct. 22, 1982, Ser. No. 436,041
Int. Cl.³ H04B *15/00;* **H04R** *25/00*
U.S. Cl. 381—68 **23 Claims**

1. A device for the hearing impaired comprising:

a portable console adapted to be positioned close to a source of sound and having a first exposed surface with a surface portion that is not recessed with respect to the rest of said first surface;

first and second omni-directional microphone means

mounted on said console, spaced to simulate human binaural auditory reception, for transducing acoustic waves in the environment surrounding said console inot first and second received signals, respectively, said first and second microphone means being mounted flush with said surface portion to eliminate pickup at said first and second microphone means of acoustic energy reflected by said first surface;



first and second channel circuits for processing said first and second received signals, respectively, to provide first and second processed signals;

first and second earphones located remote from said console for transducing electrical signals transmitted thereto into corresponding acoustic signals; and

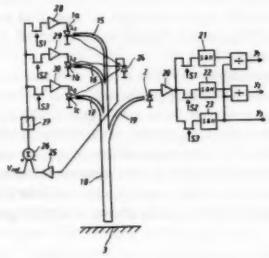
signal transmission means for transmitting said first and second processed signals to said first and second earphones, respectively.

4,531,230

OPTICAL DIGITIZER/POSITION MEASURING DEVICE

Torgny Brogardh, Västerås, Sweden, assignor to Asea Aktiebolag, Västerås, Sweden

Filed Jun. 14, 1982, Ser. No. 388,439
Claims priority, application Sweden, Jun. 16, 1981, 8103773
Int. Cl.³ G06K 9/20
U.S. Cl. 382—13 **12 Claims**



1. An optical measuring system comprising at least one optical fiber transducer and an object having a surface, the measuring system being adapted to measure position, angle, and the time dependence of these quantities in at least one dimension between said transducer and said surface of the object,

said measuring system further comprising at least one light-emitting means and said at least one optical fiber transducer to illuminate said surface, at least one photo-detector means to sense light from said light-emitting means emanating from said surface, and

at least one electronic unit for controlling the light emitted by said light-emitting means and evaluating the signal variations from said photo-detector means,

said surface being provided with an optically detectable pattern defined by variations of an optical property

said variations of at least one of said optical properties of said surface are arranged to have at least three different amplitude values in at least one direction across said surface, said amplitude values being defined by the difference between a local maximum and a local minimum of said at least one optical property of said optically detectable pattern, said local minimum lying to one side of said local maximum in said at least one direction,

said at least three different amplitude values are arranged to occur in a predetermined order in said at least one direction,

said amplitude values, which are obtained when said at least one optical fiber transducer is displaced relative to said surface, are arranged, through the opto-electronic arrangement of said light-emitting means, said at least one optical fiber transducer and said photo-detector means, to be transformed into electric signal amplitudes by said photo-detector means, and

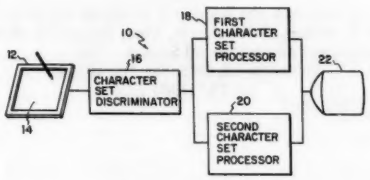
said signal amplitudes being evaluated by said electronic unit to determine the position, the angle and/or the direction of movement of said at least one optical fiber transducer relative to said surface of the object.

4,531,231

METHOD FOR DISTINGUISHING BETWEEN COMPLEX CHARACTER SETS

Hewitt D. Crane, Portola Valley; John S. Ostrem, and Peter K. Edberg, both of Palo Alto, all of Calif., assignors to Communication Intelligence Corporation, Menlo Park, Calif.

Filed Jan. 19, 1983, Ser. No. 459,283
Int. Cl.³ G06K 9/28
U.S. Cl. 382—13 **3 Claims**



1. A method for recognizing at least two different sets of complex handwritten characters in a system employing a stroke recognition means, said stroke recognition means having a plurality of regions for registration of single characters, said method comprising the steps of:

inputting signals representing a character from a first set of characters to a first character set processor, including a first character set memory, within said recognition means from within a first area within one of said regions, each said region being constrained to contain only one character and each said region being constrained to be in a predetermined sequence with respect to all other of said regions, said first area being constrained to accept signals in said first set only;

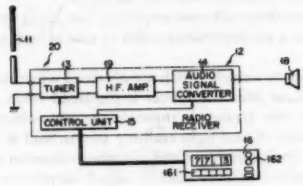
inputting signals representing a character from a second set of characters to a second character set processor, including a second character set memory, within said recognition means from within a second area within said region, said second area being constrained to accept characters in said second set only; and

sensing between input signals of said first area and of said second area in order to discriminate between said first character set and said second character set.

4,531,232
RADIO RECEIVER APPARATUS FOR VEHICLE

Takashi Sakurai, Nagoya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 25, 1983, Ser. No. 469,712
Claims priority, application Japan, Mar. 4, 1982, 57-34483; Sep. 9, 1982, 57-156973
Int. Cl.³ H04B 1/08
U.S. Cl. 455—152 12 Claims

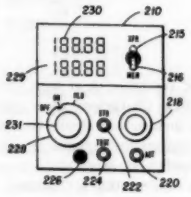


1. A radio receiver apparatus for a vehicle having a passenger compartment that comprises:
an antenna device for receiving signals;
a means for tuning said received signals;
said antenna device and said tuning means being formed as an integral unit for being mounted in a vehicle location separate from said passenger compartment;
a metallic contact member for transmitting said received signals to said tuning means;
a means, structurally separate from said integral unit, for being mounted within said passenger compartment, for remotely controlling said tuning means; and
a speaker system, structurally separate from said control means, for producing audible signals in said passenger compartment related to broadcast waves tuned by said means for tuning.

4,531,233
VARIABLE INCREMENT TUNING SELECT

David A. Nelson, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 12, 1983, Ser. No. 493,902
Int. Cl.³ H04B 1/26
U.S. Cl. 455—173 1 Claim

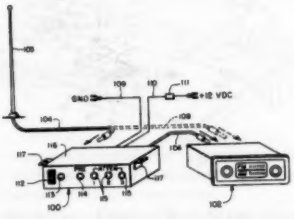


1. A tuning control for a variable frequency apparatus in an aircraft comprising:
a manual frequency selection switch means operable in an incremental selection manner and movable in two directions for providing each of a first frequency selection signal and a second frequency selection signal;
processor controlled frequency selection means for providing tuning control signals to said variable frequency apparatus in response to said first and second frequency selection signals, said processor controlled frequency selection means comprising means to sense changes of movement direction during provision of said second frequency selection signal to provide a variable incremental value signal therefor as a function of said changed movement direction, and said processor controlled frequency selection means providing said tuning control signals from said first frequency selection signal and said variable increment value signal.

4,531,234
OPTIMIZING ANTENNA INTERFACE FOR AUTOMOBILE RADIO RECEIVERS

R. Richard Bell, Libertyville, Ill., assignor to International Jensen Incorporated, Schiller Park, Ill.

Filed Feb. 14, 1983, Ser. No. 466,201
Int. Cl.³ H04B 1/18
U.S. Cl. 455—247 8 Claims



8. An automatic signal processing interface for interfacing the antenna of an automobile or other vehicle to the vehicle's FM radio receiver apparatus, said interface comprising:
means for suppressing signals of undesired frequency outside of the FM broadcast band, resulting in an FM band signal comprising substantially all signals within the FM broadcast band and no others;
controllable amplifier means for amplifying said FM band signal when desired, said means functionally coupled to said suppressing means;
controllable variable attenuator means for attenuating said FM band signal when desired; said means functionally coupled to said suppressing means;
said controllable amplifier means connected in series with said controllable attenuator means within the signal path of said FM band signal; and
means for controlling said controllable amplifier means and said controllable variable attenuator means responsive to the overall signal strength of said FM band signal, said controlling means functionally coupled to said suppressing means,
said controllable amplifier means and said controllable attenuator means being individually or collectively inserted into or removed from said signal path, under the control of said controlling means, such that said FM band signal is amplified by said controllable amplifier means when said FM signal is below a first general threshold level, and is attenuated by said controllable variable attenuator means when said FM signal is above a second general threshold level.

4,531,235
DIVERSITY SIGNAL STRENGTH INDICATOR AND SITE SELECTION APPARATUS FOR USING SAME

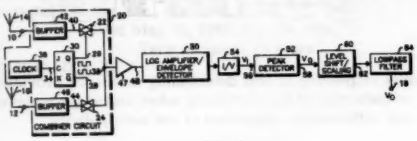
Karl R. Brusen, Fox River Grove, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 20, 1983, Ser. No. 505,626
Int. Cl.³ H04B 1/16; G01R 19/04
U.S. Cl. 455—273 29 Claims

1. A diversity signal strength indicator circuit, comprising, in combination:
a pair of terminals for receipt of two separate input diversity signals from two spaced antennas;
means for combining said two separate diversity input signals to produce a composite signal representative of the average amplitude of said two diversity input signals;

means for producing an intermediate log signal which is proportional to a logarithm of said composite signal;

means for detecting a peak magnitude of said intermediate log signal to produce a second intermediate signal proportional to said peak of said intermediate log signal; and



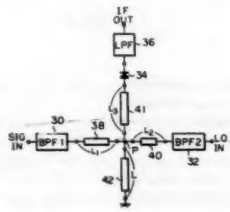
means for developing an output DC voltage signal which is proportional to an average magnitude of said second intermediate signal and thus proportional to the average signal strengths of said two input diversity signals.

4,531,236

MICROWAVE INTEGRATED CIRCUIT FREQUENCY CONVERTER

Hiroyuki Ishihara, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 8, 1982, Ser. No. 447,826
Claims priority, application Japan, Dec. 11, 1981, 56-200511
Int. Cl.³ H04B *1/10, 1/26*
U.S. Cl. 455—302 **2 Claims**



1. A microwave integrated circuit frequency converter comprising:

first bandpass filter means having an input connected to receive a signal frequency;

second bandpass filter means having an input connected to receive a local oscillator frequency;

first transmission line means connecting an output of the first bandpass filter means to a junction;

second transmission line means connecting an output of the second bandpass filter means to the junction;

low pass filter means constructed to pass an intermediate frequency and reflect the signal and local oscillator frequencies and an image frequency;

third transmission line means connecting the low pass filter means to the junction;

diode means coupled between the third transmission line means and an input of the low pass filter means; and

parallel stub line means having one end short-circuited and another end connected to the junction,

electrical lengths of the first and second transmission line means and the parallel stub line means being selected so that an impedance seen from the junction is open-circuited to the signal frequency and the local oscillator frequency,

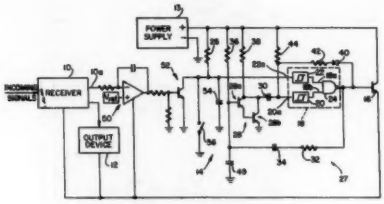
the electrical length of the third transmission line means being selected so that an impedance seen from the diode is open-circuited or short-circuited for the image frequency.

4,531,237

ENERGY CONSERVATION CIRCUIT FOR STANDBY OPERATION

Yair Bar-on, and Gavriel Horn, both of Elbit Computers Ltd., P.O. Box 5390, Haifa, Israel

Continuation of Ser. No. 320,648, Nov. 12, 1981, abandoned, which is a continuation of Ser. No. 149,712, May 14, 1980, abandoned. This application Nov. 22, 1983, Ser. No. 554,170
Int. Cl.³ H04B *1/16;* **H03K** *3/295*
U.S. Cl. 455—343 **5 Claims**



1. An oscillator powered by a power supply comprising

A. a logic circuit comprising the cascaded combination of a Schmitt trigger and an inverter and having an input terminal and an output terminal,

B. a transistor amplifier having an input terminal and an output terminal,

C. a first capacitor connected between said output terminal of said amplifier and said input terminal of said logic circuit,

D. a second capacitor connected between the output terminal of the logic circuit and the input terminal of the amplifier,

E. first impedance means connected between said power supply and said input terminal of said amplifier and,

F. unidirectional second impedance means connected between the output terminal of said logic circuit and input terminal of said logic circuit, whereby:

i. the output of said logic circuit switches between a first level and a second level, and

ii. when said logic circuit output switches to the first level, a corresponding voltage change passed by said second capacitor terminates conduction by said amplifier, and

iii. conduction by said first impedance means then changes the voltage on said second capacitor to initiate conduction by said amplifier,

iv. initiation of amplifier conduction causing said first capacitor to apply a voltage change at said logic circuit input terminal, resulting in said second level of said logic circuit output,

v. said second impedance means conducting during the occurence of said second level to apply a voltage change at said logic circuit input terminal, resulting in said first level of said logic circuit output.

4,531,238

STATISTICAL CONTENTION CONTROL FOR STAR CONFIGURED COMMUNICATION NETWORKS

Eric G. Rawson, Saratoga; Hallam G. Murray, Menlo Park; Ronald V. Schmidt, Portola Valley, and Lawrence C. Stewart, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 3, 1981, Ser. No. 326,869
Int. Cl.³ H04B *9/00*
U.S. Cl. 455—601 **10 Claims**

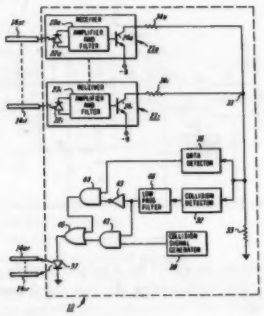
1. In a star configured communications network having a plurality of terminals, a common node, and a plurality of bidirectional communication channels coupled between said common node and respective ones of said terminals for transferring data to and from said terminals; the improvement comprising

a data detector within said common node for detecting data received from said terminals,

a collision signal generator for supplying a collision signal,

a collision detector within said common node for supplying a control signal whenever data is being received from at least two of said terminals simultaneously,

logic means within said common node; said logic means being coupled to said data detector, said collision signal generator, and said collision detector for selectively coupling said data detector and said collision signal generator to said communication channels in the absence and pres-



ence of said control signal, respectively, whereby data is transferred to said terminals whenever data is being received from only one of said terminals and said collision signal is transferred to said terminals in lieu of data whenever data is being received from at least two of said terminals simultaneously, and

means coupled to said terminals for resetting said terminals in response to said collision signal, whereby said terminals contend for control of said network and are subject to being reset whenever they compete for control.

4,531,239

OPTICAL RECEIVER HAVING COLLISION DETECTION FUNCTION

Takeshi Usui, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

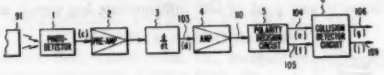
Filed Apr. 26, 1983, Ser. No. 488,877
Claims priority, application Japan, Apr. 30, 1982, 57-73146
Int. Cl.³ H04B 9/00
U.S. Cl. 455—607 **8 Claims**

1. An optical receiver for use in collision detection of optical signals comprising:

means for detecting an optical signal and for converting said detected signal into an electrical signal;

means for differentiating the electrical signal to produce a differentiated signal of electrical pulses;

means for determining the polarity of the pulses in the differentiated signal; and



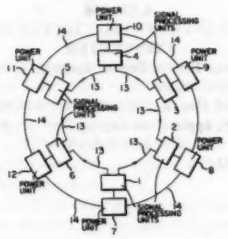
means responsive to said determining means for providing an indication of signal collision when successive pulses of said differentiated signal are of the same polarity.

4,531,240

DATA COMMUNICATION SYSTEM

Yoshikazu Yokomizo, Kawagoe, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 426,948
Int. Cl.³ H04B 9/00
U.S. Cl. 455—607 **5 Claims**



1. An apparatus constituting a part of a communication system, said apparatus comprising:

an electrically powered input unit for receiving signals from a first signal transmission path;

an electrically powered output unit for sending signals to a second signal transmission path;

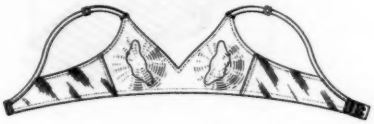
an electrically powered signal processing unit for receiving signals from said input unit, for processing the signals and for delivering the processed signals to said output unit;

power supply means for supplying electric power to said input unit, said output unit and said signal processing unit so as to drive said units;

transmission means adapted to directly transmit the signals received by said input unit to said output unit, when said signal processing unit is not in an operable condition; and

an input line for taking in electrical power from power supply means of other similar apparatus constituting a part of said communication system, wherein when said signal processing unit is not in an operable condition, said input unit and said output unit are driven with electric power taken in through said input line so as to permit said transmission means to directly transmit the signals received by said input unit to said output unit.

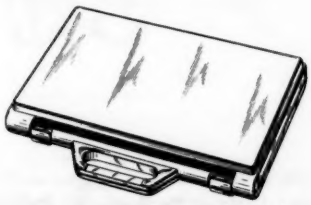
279,725
BRASSIERE
Anthony Tedeschi, Highland Lakes, N.J., assignor to International Playtex, Inc., Stamford, Conn.
Filed May 20, 1983, Ser. No. 496,772
Term of patent 14 years
U.S. Cl. D2—24



279,726
BRASSIERE
Donald Nienstedt, West Milford, and Anthony Tedeschi, Highland Lake, both of N.J., assignors to International Playtex, Inc., Stamford, Conn.
Filed May 20, 1983, Ser. No. 496,779
Term of patent 14 years
U.S. Cl. D2—24

279,727
NOVELTY WRAP
Maureen R. Mitchell, 2423 Glenview, Glenview, Ill. 60025
Filed Sep. 30, 1982, Ser. No. 428,963
Term of patent 14 years
U.S. Cl. D2—343

279,728
CARRYING CASE
Masaki Kurihara, Suwa, Japan, assignor to Epson Corporation and Kabushiki Kaisha Suwa Seikosha, both of Tokyo, Japan
Filed May 2, 1983, Ser. No. 490,708
Claims priority, application Japan, Nov. 2, 1982, 57-49853
Term of patent 14 years
U.S. Cl. D3—73



279,729
BRUSH APPLICATOR
Eugene Polanish, 169 Western Hwy., West Nyack, N.Y. 10994
Filed Dec. 1, 1983, Ser. No. 557,194
Term of patent 14 years
U.S. Cl. D4—135

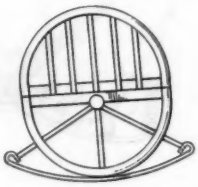
279,730
TIE RACK OR THE LIKE
William D. Ritchey, 1617 M St., Bedford, Ind. 47421
Division of Ser. No. 400,742, Jul. 22, 1982, Pat. No. Des. 276,673. This application Sep. 10, 1984, Ser. No. 648,769
Term of patent 14 years
U.S. Cl. D6—327

279,731
STOOL
Irwin J. Ferdinand, 396 Sheridan Rd., Glencoe, Ill. 60022; Milton C. Handler, 3330 Old Mill, Northbrook, Ill. 60062; Richard Sylvan, 2731 Virginia La., Glenview, Ill. 60025, and Michael Peterson, 420 Elmwood, Evanston, Ill. 60202
Filed Aug. 22, 1983, Ser. No. 525,417
Term of patent 14 years
U.S. Cl. D6—352

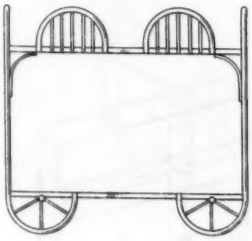
279,732
SWIVEL LOUNGE CHAIR
Jan Zlotnick, 181 Long Hill Rd., Apt. 11-1, Little Falls, N.J. 07424
Filed Mar. 30, 1983, Ser. No. 480,242
Term of patent 14 years
U.S. Cl. D6—361

279,733
CHAIR
Noboru Nakamura, Sapporo, Japan, assignor to Mohly Shop Co., Ltd., Osaka, Japan
Filed Sep. 17, 1982, Ser. No. 419,510
Claims priority, application Japan, Apr. 22, 1982, 57-17613
Term of patent 14 years
U.S. Cl. D6—373

279,734
CRADLE FRAME
Charles D. Anacker, 575 24th St., Hermosa Beach, Calif. 90254, assignor to Charles D. Anacker, Hermosa Beach, Calif.
Filed Apr. 12, 1983, Ser. No. 483,960
Term of patent 14 years
U.S. Cl. D6—388

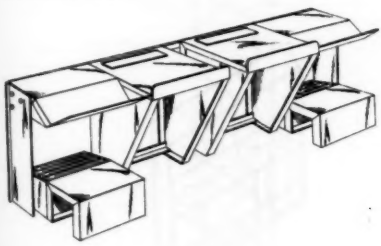


279,735
BUNK BED FRAME
Charles D. Anacker, 575 24th St., Hermosa Beach, Calif. 90254, assignor to Charles D. Anacker, Hermosa Beach, Calif.
Filed Apr. 12, 1983, Ser. No. 484,181
Term of patent 14 years
U.S. Cl. D6—388

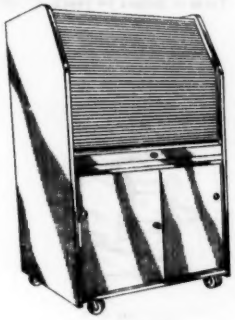


279,736
COLLAPSIBLE WORKBENCH OR SIMILAR ARTICLE
Stephen R. Zastera, and Roger Callies, both of Bloomington, Minn., assignors to D.R.I. Industries, Inc., Bloomington, Minn.
Filed Apr. 8, 1983, Ser. No. 483,239
Term of patent 14 years
U.S. Cl. D6—400

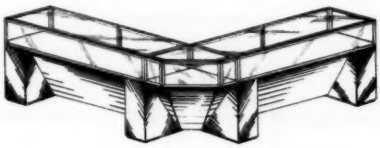
279,737
WORK STATION MODULE
Frank Lavenger, Auburn, and Dean Kelley, Lewiston, both of Me., assignors to Diamond Machine Company, Lewiston, Me.
Filed Jul. 7, 1982, Ser. No. 395,938
Term of patent 14 years
U.S. Cl. D6—423



279,738
CABINET FOR A COMPUTER TERMINAL
George Dawe, 21 High Rd., Newbury, Mass. 01950
Filed Jan. 6, 1983, Ser. No. 455,991
Term of patent 14 years
U.S. Cl. D6—433

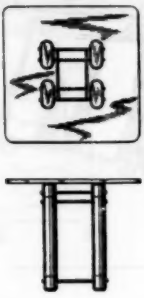


279,739
CORNER DISPLAY CASE
John E. Aspenwall, Sandy, Utah, assignor to Jahabow Industries, Owensville, Mo.
Filed Jan. 27, 1983, Ser. No. 461,374
Term of patent 14 years
U.S. Cl. D6—471

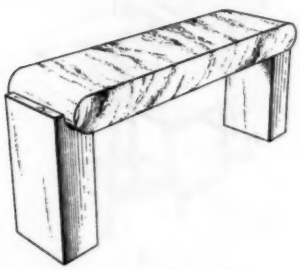


279,740
COMPUTER DESK
Thomas E. Slager, 23439 Lakeview, Edwardsburg, Mich. 49112
Filed Feb. 7, 1983, Ser. No. 464,775
Term of patent 14 years
U.S. Cl. D6—478

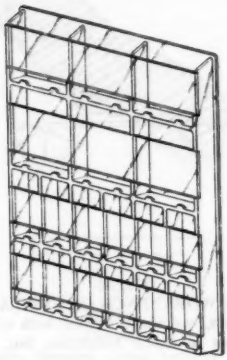
279,741
DINING TABLE
R. Scott Bromley, New York, N.Y., assignor to Cartier Inc., New York, N.Y.
Division of Ser. No. 433,353, Oct. 7, 1982,. This application Nov. 23, 1984, Ser. No. 674,336
Term of patent 14 years
U.S. Cl. D6—480



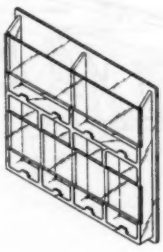
279,742
CONSOLE
James DiPersia, Closter, N.J., assignor to Avento Designs Inc., New York, N.Y.
Filed Mar. 22, 1983, Ser. No. 477,748
Term of patent 14 years
U.S. Cl. D6—484



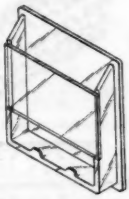
279,743
DISPLAY RACK
Arthur S. Kellogg, 11706 Ficus St., Palm Beach Gardens, Fla. 33410
Filed Aug. 5, 1983, Ser. No. 494,731
Term of patent 14 years
U.S. Cl. D6—517



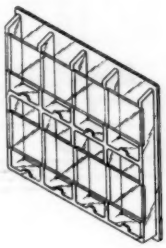
279,744
DISPLAY RACK
Arthur S. Kellogg, 11706 Ficus St., Palm Beach Gardens, Fla. 34410
Filed Aug. 5, 1983, Ser. No. 494,732
Term of patent 14 years
U.S. Cl. D6—517



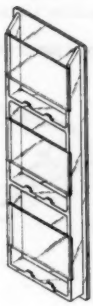
279,745
DISPLAY RACK
Arthur S. Kellogg, 11706 Ficus St., Palm Beach Gardens, Fla. 33410
Filed Aug. 5, 1983, Ser. No. 494,733
Term of patent 14 years
U.S. Cl. D6—517



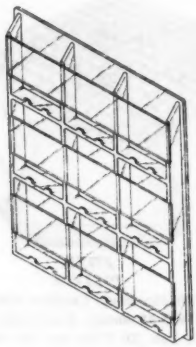
279,746
DISPLAY RACK
Arthur S. Kellogg, 11706 Ficus St., Palm Beach Gardens, Fla. 33410
Filed Aug. 5, 1983, Ser. No. 494,736
Term of patent 14 years
U.S. Cl. D6—517



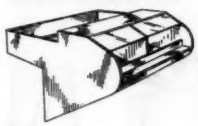
279,747
DISPLAY RACK
Arthur S. Kellogg, 11706 Ficus St., Palm Beach Gardens, Fla. 33410
Filed Aug. 5, 1983, Ser. No. 494,737
Term of patent 14 years
U.S. Cl. D6—517

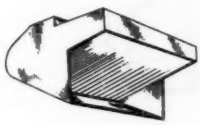


279,748
DISPLAY RACK
Arthur S. Kellogg, 11706 Ficus St., Palm Beach Gardens, Fla. 33410
Filed Aug. 5, 1983, Ser. No. 494,738
Term of patent 14 years
U.S. Cl. D6—517

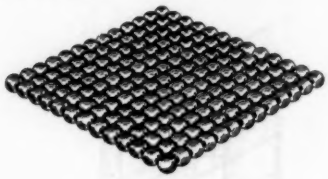


279,749
DISPLAY BIN
Romanino Vona, 4490 Appleby Line, Burlington Ontario, Canada
Filed Jul. 9, 1982, Ser. No. 396,956
Claims priority, application Canada, Mar. 31, 1982, 31-03-82-15
The portion of the term of this patent subsequent to Jul. 13, 1996, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—573

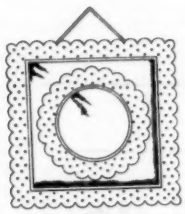




279,750
ANTISLIP FLEXIBLE MAT
Walter Zeischegge, Blumenscheinweg 10, Ulm, and Bernd Brüssing, Bilharzstr. 3, Ulm-Lehr, both of Fed. Rep. of Germany (D-7900)
Filed Jun. 29, 1982, Ser. No. 393,527
Term of patent 14 years
U.S. Cl. D6—582

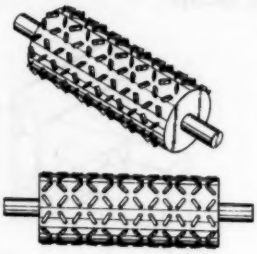


279,751
PILLOW
Stella Potts, 12720 Alcombuy, Cerritos, Calif. 90701, and Jane A. Patterson, 5423 Mountain, Lakewood, Calif. 90712
Filed Feb. 25, 1983, Ser. No. 469,793
Term of patent 14 years
U.S. Cl. D6—601



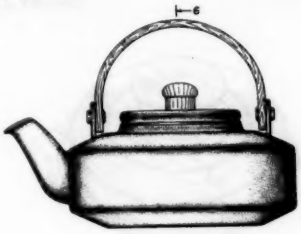
279,752
DRINKING VESSEL
Vivienne D. Jagger, Perth, Australia, assignor to Little People Limited, Hong Kong, Hong Kong
Filed Dec. 28, 1982, Ser. No. 453,923
Claims priority, application United Kingdom, Jul. 8, 1982, 1007610
Term of patent 14 years
U.S. Cl. D7—10

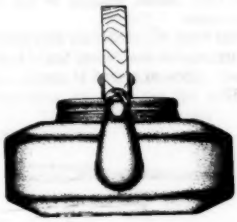
279,753
DOUGH EMBOSSER
Roy R. Ricke, Salina, Kans., assignor to Schwann's Sales Enterprises, Inc., Marshall, Minn.
Filed Sep. 1, 1982, Ser. No. 413,884
Term of patent 14 years
U.S. Cl. D7—74



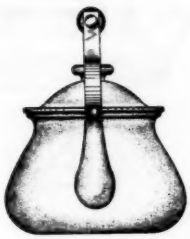
279,754
GARLIC SQUEEZER
Erik L. Hansen, Roskilde, Denmark, assignor to Rosti A/S, Ballerup, Denmark
Filed Sep. 28, 1982, Ser. No. 426,032
Claims priority, application United Kingdom, May 5, 1982, 1006549
Term of patent 14 years
U.S. Cl. D7—101

279,755
KETTLE
Michael Lax, New York, N.Y., assignor to American Commercial Incorporated, Secaucus, N.J.
Filed Jan. 7, 1983, Ser. No. 456,488
Term of patent 14 years
U.S. Cl. D7—320

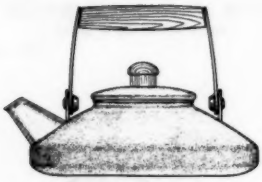




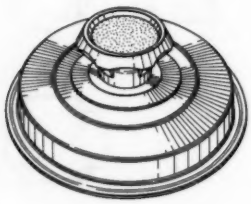
279,756
KETTLE
Michael Lax, New York, N.Y., assignor to American Commercial Incorporated, Secaucus, N.J.
Filed Jan. 7, 1983, Ser. No. 456,489
Term of patent 14 years
U.S. Cl. D7—320



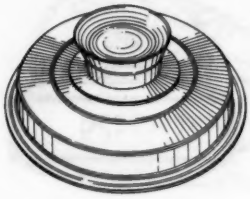
279,757
KETTLE
Michael Lax, New York, N.Y., assignor to American Commercial Incorporated, Secaucus, N.J.
Filed Jan. 7, 1983, Ser. No. 456,487
Term of patent 14 years
U.S. Cl. D7—320



279,758
CONTAINER LID
William C. Cesaroni, Glenview, Ill., and Robert P. Rauen, West Bend, Wis., assignors to Dart Industries Inc., Northbrook, Ill.
Filed Mar. 8, 1983, Ser. No. 473,295
Term of patent 14 years
U.S. Cl. D7—391



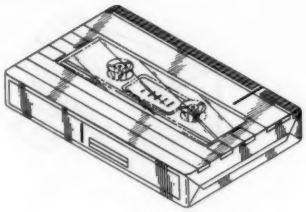
279,759
CONTAINER LID
William C. Cesaroni, Glenview, Ill., and Robert P. Rauen, West Bend, Wis., assignors to Dart Industries Inc., Northbrook, Ill.
Filed Mar. 11, 1983, Ser. No. 474,237
Term of patent 14 years
U.S. Cl. D7—391



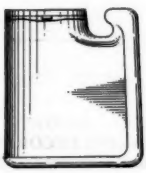
279,760
SCISSORS
Tamoru Asano, Gifu, Japan, assignor to Kai Jirushi Hamono Center, Gifu, Japan
Filed Mar. 12, 1982, Ser. No. 357,478
Claims priority, application Japan, Sep. 14, 1981, 56-40391
Term of patent 14 years
U.S. Cl. D8—57

279,761
LIFT AND TURN LATCH HANDLE
Lee S. Weinerman, Strongsville, and Fredrick L. Putzier, Columbia Station, both of Ohio, assignors to The Eastern Company, Cleveland, Ohio
Filed Jul. 20, 1983, Ser. No. 515,921
Term of patent 14 years
U.S. Cl. D8—306

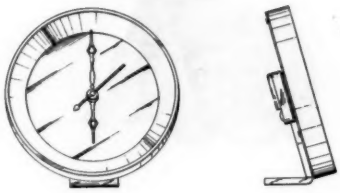
279,762
WRAPPING SHEET FOR MAGNETIC TAPE CASSETTE
Keiichi Yoshizawa, Chiba, Japan, assignor to TDK Corporation, Tokyo, Japan
Filed Jul. 26, 1982, Ser. No. 401,465
Term of patent 14 years
U.S. Cl. D9—305



279,763
CONTAINER FOR PAINT OR THE LIKE
Borge Hestehave, Alta Loma, and Kjeld Hestehave, Upland, both of Calif., assignors to Bomatic, Inc., Ontario, Calif.
Filed Mar. 18, 1983, Ser. No. 476,863
Term of patent 14 years
U.S. Cl. D9—375



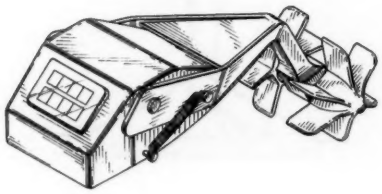
279,764
CLOCK
Gordon P. Rhoades, 726 W. Rockwood, Springfield, Mo. 65897
Filed Feb. 2, 1983, Ser. No. 463,079
Term of patent 14 years
U.S. Cl. D10—23



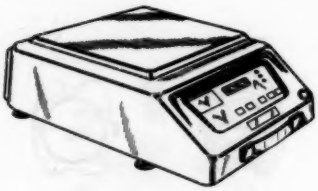
279,765
WATCH CASE
Fernando Fontana, Sesto Calende, Italy, assignor to Omega S.A., Bienne, Switzerland
Filed Aug. 27, 1982, Ser. No. 412,350
Claims priority, application France, Mar. 5, 1982, 72 217
Term of patent 14 years
U.S. Cl. D10—32

279,766
ULTRASONIC SONAR
Keisuke Honda, 62-1, Aza Shinsanbongi, Sanbongi-cho, Toyohashi-shi, Aichi, Japan
Filed Jun. 18, 1982, Ser. No. 390,120
Claims priority, application Japan, Apr. 23, 1981, 56-17635
Term of patent 14 years
U.S. Cl. D10—46

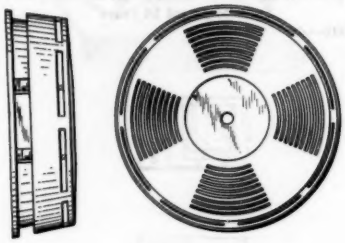
279,767
DISTANCE MEASURING SKI ATTACHMENT
Sharzad Razmjoo, 3963 Crans S/Sierre, Valais, Switzerland
Filed May 31, 1983, Ser. No. 499,511
Term of patent 14 years
U.S. Cl. D10—70



279,768
PORTABLE SCALE
Eric A. Gard, Lancaster, Pa., assignor to Pennsylvania Scale Company, Leola, Pa.
Filed Dec. 13, 1982, Ser. No. 449,537
Term of patent 14 years
U.S. Cl. D10—91

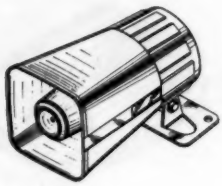


279,769
SMOKE DETECTOR
Hugh P. Thornton, Jr., Acton, and Robert B. Powers, Norwell, both of Mass., assignors to American District Telegraph Company, Jersey City, N.J.
Filed Aug. 19, 1983, Ser. No. 524,589
Term of patent 14 years
U.S. Cl. D10—106



279,770
WARNING LIGHT
Norman A. Parker, 10 W. Logan St., Philadelphia, Pa. 19144
Filed Dec. 15, 1981, Ser. No. 330,970
Term of patent 14 years
U.S. Cl. D10—114

279,771
SIREN
Kozaburo Hinata, Wako, Japan, assignor to Kobishi Electric Co., Ltd., Japan
Filed Dec. 19, 1983, Ser. No. 562,702
Term of patent 14 years
U.S. Cl. D10—120

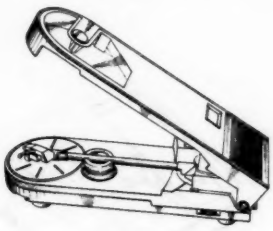


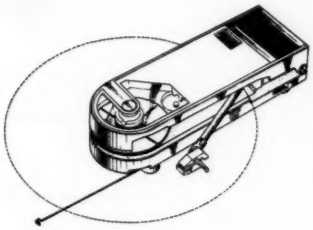
279,772
HANGING DECORATION
Brigitte Breyer-Lindner, Habichstrasse 34, 8025 Unterhaching-/Fasanenpark, Fed. Rep. of Germany
Division of Ser. No. 180,057, Aug. 20, 1980, which is a division of Ser. No. 964,017, Nov. 27, 1978, Pat. No. Des. 265,386. This application Jul. 27, 1982, Ser. No. 402,278
Claims priority, application Fed. Rep. of Germany, May 27, 1978, AR 30/78
Term of patent 14 years
U.S. Cl. D11—81

279,773
HANGING DECORATION
Brigitte Breyer-Lindner, Habichstrasse 34, 8025 Unterhaching-/Fasanenpark, Fed. Rep. of Germany
Division of Ser. No. 180,057, Aug. 20, 1980, , which is a division of Ser. No. 964,017, Nov. 27, 1978, Pat. No. Des. 265,386. This application Jul. 27, 1982, Ser. No. 402,362
Claims priority, application Fed. Rep. of Germany, May 27, 1978, AR 30/78
Term of patent 14 years
U.S. Cl. D11—81

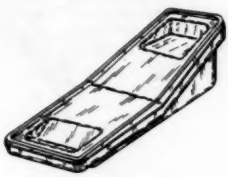
279,774
FIGURINE OF AN ARMADILLO
Jesus A. C. Carbajales Santa-Eulalia, and Javier B. C. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Jun. 17, 1982, Ser. No. 389,543
Term of patent 14 years
U.S. Cl. D11—158

279,775
RECORD DISC PLAYER SYSTEM OR SIMILAR ARTICLE
Mitsuo Nemoto, Machida, Japan, assignor to Kabushiki Kaisha Audio-Technica, Tokyo, Japan
Filed May 9, 1983, Ser. No. 492,725
Claims priority, application Rep. of Korea, Nov. 11, 1982, 10022
Term of patent 14 years
U.S. Cl. D14—14





279,776
MODULAR TELEPHONE BASE UNIT
Michael Mitchell, Huntsville, Ala., assignor to GTE Business Communication Systems, Northlake, Ill.
Filed May 2, 1983, Ser. No. 490,829
Term of patent 14 years
U.S. Cl. D14—60



279,777

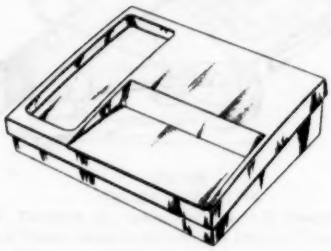
TELEPHONE INSTRUMENT BASE FOR A HANDSET

Kenneth R. Cooke, New York, and Vito L. Porcelli, Ossining, both of N.Y., assignors to AT&T Technologies, Inc., New York, N.Y.

Division of Ser. No. 570,942, Jan. 16, 1984, Pat. No. Des. 277,958. This application Aug. 10, 1984, Ser. No. 639,904

Term of patent 14 years

U.S. Cl. D14—60



279,778

BASE WITH DIALING MEANS, FOR A TRANSCEIVER HANDSET

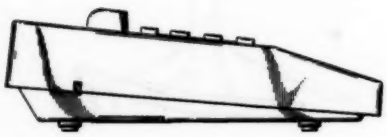
John Stoddard, Hackney, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Oct. 14, 1982, Ser. No. 434,422

Claims priority, application United Kingdom, Apr. 26, 1982, 1006368

Term of patent 14 years

U.S. Cl. D14—62



279,779

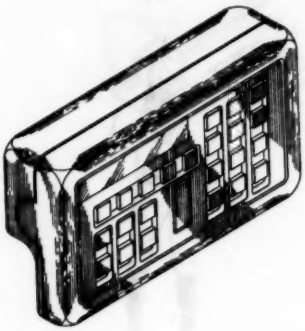
CONTROL UNIT FOR A TWO-WAY RADIO OR SIMILAR ARTICLE

Terrance N. Taylor, Cary, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 21, 1983, Ser. No. 477,271

Term of patent 14 years

U.S. Cl. D14—68



279,780

FACSIMILE TRANSCEIVER

Katsuhiko Nishiwaki, Higashimurayama; Akitaka Takeuchi, Kodaira; Hiroshi Endo; Akihiro Kawakami, both of Yokohama, and Hideo Matsumura, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 24, 1983, Ser. No. 478,370

Claims priority, application Japan, Oct. 27, 1982, 57-48484

Term of patent 14 years

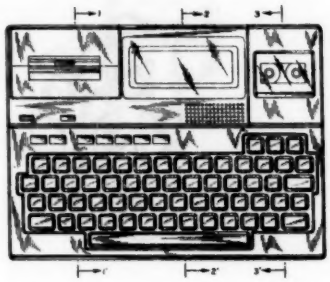
U.S. Cl. D14—94

279,781

PORTABLE PERSONAL COMPUTER

Yoshikazu Kawakami, Shiojiri, Japan, assignor to Epson Corporation, Nagano and Kabushiki Kaisha Suwa Seikosha, Tokyo, both of, Japan

Filed Nov. 19, 1982, Ser. No. 443,088
Claims priority, application Japan, May 20, 1982, 57-22052
Term of patent 14 years
U.S. Cl. D14—100



279,782

COMPUTER TERMINAL

Joseph Bismanovsky; Ronald E. Clements, and Melvin Rudin, all of Santa Clara County, Calif., assignors to Lane Telecommunications, Inc., Houston, Tex.

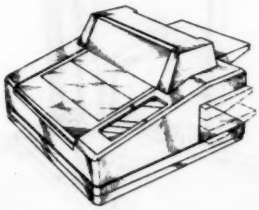
Filed Feb. 28, 1983, Ser. No. 470,770
Term of patent 14 years
U.S. Cl. D14—106

279,783

INTEGRATED PRINTER AND FEEDER HOUSING

James B. Jordan, Berkeley, and John E. Jamieson, Danville, both of Calif., assignors to Qume Corporation, San Jose, Calif.

Filed May 13, 1983, Ser. No. 494,601
Term of patent 14 years
U.S. Cl. D14—111

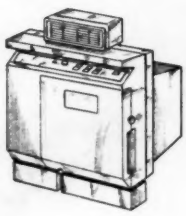


279,784

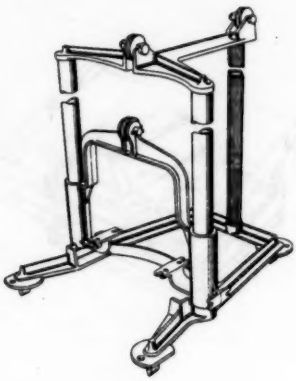
PUMP HOUSING FOR A ROLLER PAINTING MACHINE

H. Richard Roudebush, Hancock County, Ind., assignor to Triune Systems, Inc., Carmel, Ind.

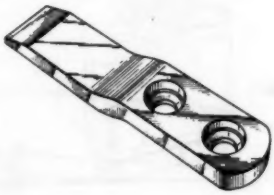
Filed May 5, 1982, Ser. No. 375,346
Term of patent 14 years
U.S. Cl. D15—7



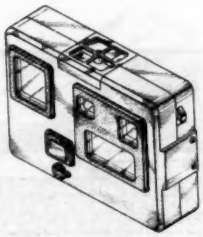
279,785
SUPPORT FOR A POWER MASK FOR DRILLING WELLS
Michael C. Vaughan, 2200 Anderson Rd., Opelika, Ala. 36802
Filed Dec. 22, 1982, Ser. No. 433,285
Term of patent 14 years
U.S. Cl. D15—21



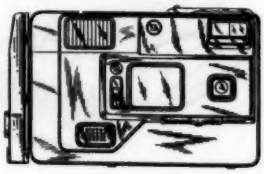
279,786
TOOTH FOR BUCKETS ON DIGGING AND LOADING MACHINES
Olav Nja, Kvernaland, Norway, assignor to Kverneland A/S, Kvernaland, Norway
Filed Jun. 6, 1983, Ser. No. 501,102
Claims priority, application Norway, Dec. 28, 1982, 63619
Term of patent 14 years
U.S. Cl. D15—29



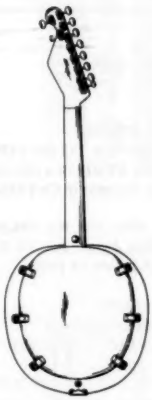
279,787
WATERPROOF BOX FOR A CAMERA
Henri Socias, Rte. de Lausanne 60, CH-1020 Renens-Lausanne, Switzerland
Filed Mar. 30, 1983, Ser. No. 480,347
Claims priority, application Hague, Sep. 30, 1982, 72659
Term of patent 14 years
U.S. Cl. D16—2



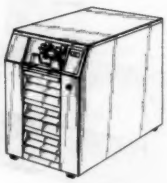
279,788
PHOTOGRAPHIC CAMERA
Fumitaka Io, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Mar. 4, 1983, Ser. No. 472,347
Claims priority, application Japan, Sep. 8, 1982, 57-41059; Sep. 8, 1982, 57-41060
Term of patent 14 years
U.S. Cl. D16—6



279,789
STRINGED MUSICAL INSTRUMENT
Herman Fox, 55 Vine St., Asheville, N.C. 28804
Filed Mar. 21, 1983, Ser. No. 477,140
Term of patent 14 years
U.S. Cl. D17—18



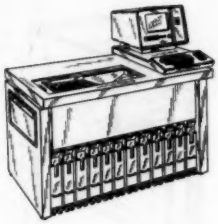
279,790
BANK NOTE TAKEOUT MACHINE
Takashi Kajita, Kodaira, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Jan. 4, 1983, Ser. No. 455,547
Claims priority, application Japan, Jul. 7, 1982, 57-30354
Term of patent 14 years
U.S. Cl. D18—3



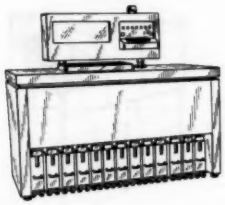
279,791
CASH CLASSIFYING AND TOTALIZING MACHINE
Yoshiaki Nishida, Omorinishi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Mar. 11, 1983, Ser. No. 474,333
Claims priority, application Japan, Sep. 14, 1982, 57-41682
Term of patent 14 years
U.S. Cl. D18—3

279,792
COIN-SORTING AND COUNTING MACHINE
Roger K. Childers, Tigard, Oreg., assignor to Childers Corporation, Wilsonville, Oreg.
Filed Dec. 2, 1983, Ser. No. 557,259
Term of patent 14 years
U.S. Cl. D18—3

279,793
COIN-SORTING AND COUNTING MACHINE
Roger K. Childers, Portland County, Oreg., assignor to Childers Corporation, Wilsonville, Oreg.
Filed Dec. 2, 1983, Ser. No. 557,266
Term of patent 14 years
U.S. Cl. D18—3



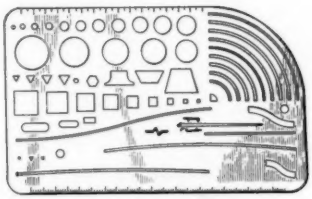
279,794
COIN-SORTING AND COUNTING MACHINE
Roger K. Childers, Portland County, Oreg., assignor to Childers Corporation, Wilsonville, Oreg.
Filed Dec. 2, 1983, Ser. No. 557,267
Term of patent 14 years
U.S. Cl. D18—3



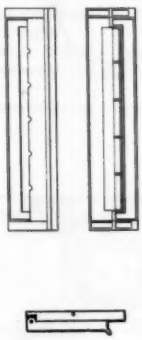
279,795
FONT OF TYPE
Claire Leray, Paris, France, assignor to Essilor International, Cie Generale d'Optique, Creteil Cedex, France
Filed Dec. 20, 1982, Ser. No. 451,444
Claims priority, application France, Jun. 22, 1982, 822161
Term of patent 14 years
U.S. Cl. D18—24

279,796
PHOTOGRAPHIC DISPLAY APPARATUS
Roy D. Heliton, 3111 Dowling St., Houston, Tex. 77004
Filed Jun. 7, 1982, Ser. No. 385,908
Term of patent 14 years
U.S. Cl. D19—26

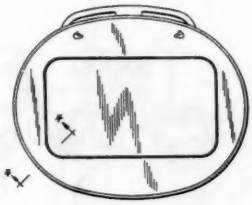
279,797
SURVEYOR'S TEMPLATE
Robert H. Brunetto, 1101 W. Stevens, #41, Santa Ana, Calif. 92707
Filed Sep. 30, 1982, Ser. No. 431,740
Term of patent 14 years
U.S. Cl. D19—37



279,798
TOOL FOR SETTLING PAPER TO BE PUNCHED WITH NUMEROUS PERFORATIONS
Chuzo Mori, Tokyo, Japan, assignor to Carl Manufacturing Co., Ltd., Tokyo, Japan
Filed Jan. 7, 1983, Ser. No. 456,355
Claims priority, application Japan, Jul. 10, 1982, 57-31169
Term of patent 14 years
U.S. Cl. D19—72

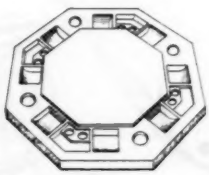


279,799
BICYCLE LICENSE PLATE
Sam Kupperman, Northbrook, and Dennis Kupperman, Glenview, both of Ill., assignors to RB Toy Development Co., Skokie, Ill.
Filed Jun. 27, 1983, Ser. No. 508,092
Term of patent 14 years
U.S. Cl. D20—13

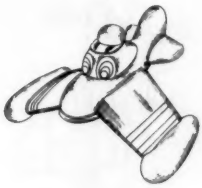


279,800
DISPLAY BOARD
Willie J. Glenn, 10509 Fourth Ave., Inglewood, Calif. 90303
Filed Apr. 18, 1983, Ser. No. 485,965
Term of patent 14 years
U.S. Cl. D20—42

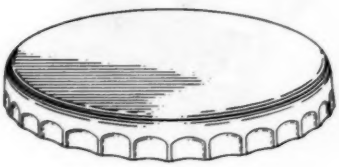
279,801
CARD TABLE TOP
Joseph M. Brockenshire, 13 Bellevue Rd., Dromana, Australia (3936)
Filed Sep. 29, 1982, Ser. No. 426,553
Claims priority, application Australia, Jul. 13, 1982, 0921/82
Term of patent 14 years
U.S. Cl. D21—37



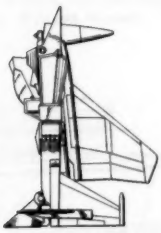
279,802
TOY AIRPLANE
John Nottingham, 4875 Stacy Ct., Richmond Heights, Ohio 44143
Filed May 19, 1983, Ser. No. 496,237
Term of patent 14 years
U.S. Cl. D21—83



279,803
AERIAL TOY
Peter R. Manning, Norwalk, Conn., assignor to Dixon-Manning Sales and Marketing Limited, Devon, England
Filed Dec. 2, 1981, Ser. No. 326,764
Term of patent 14 years
U.S. Cl. D21—86

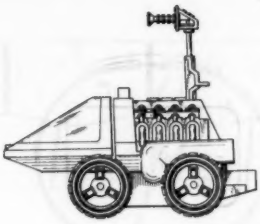


279,804
RECONFIGURABLE TOY PLANE
Kouzin Ohno, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Mar. 26, 1984, Ser. No. 593,559
Claims priority, application Japan, Mar. 10, 1983, 58-34757
Term of patent 14 years
U.S. Cl. D21—87

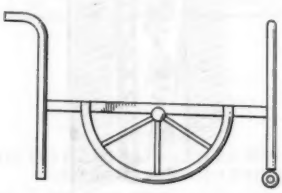


279,805
TOY TYPEWRITER
Cheuk Sun Ng, Hong Kong, Hong Kong, assignor to Blue Box Toy Factory Limited, Hong Kong, Hong Kong
Filed Feb. 2, 1983, Ser. No. 463,357
Claims priority, application United Kingdom, Aug. 23, 1982, 1-008-390
Term of patent 14 years
U.S. Cl. D21—127

279,806
TOY SPACE VEHICLE
Carl M. Stern, and Karl D. Lerch, both of East Aurora, N.Y., assignors to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 27, 1983, Ser. No. 461,458
Term of patent 14 years
U.S. Cl. D21—128

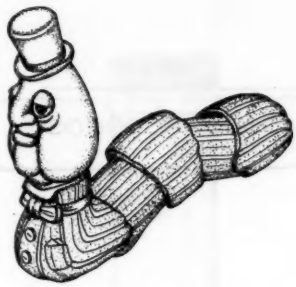


279,807
TOY CART FRAME
Charles D. Anacker, 575 24th St., Hermosa Beach, Calif. 90254, assignor to Charles D. Anacker, Hermosa Beach, Calif.
Filed Apr. 12, 1983, Ser. No. 484,182
Term of patent 14 years
U.S. Cl. D21—141



279,808
FIGURE TOY
Daniel A. Pharo, 601 Tawny Port Dr., Lodi, Calif. 95240
Filed Jan. 24, 1983, Ser. No. 460,103
Term of patent 14 years
U.S. Cl. D21—155

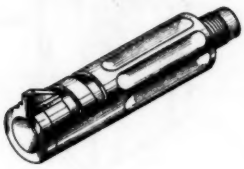
279,809
SEGMENTED TOY FIGURE
Russell C. Edmisson, Manhattan Beach, and Leo J. Munson, Van Nuys, both of Calif., assignors to American Greetings Corporation, Cleveland, Ohio
Filed Feb. 4, 1983, Ser. No. 464,086
Term of patent 14 years
U.S. Cl. D21—185



279,810
EXERCISE BOARD
James Robert Noble, Mountain Rd., Henderson R.D. 1, Auckland, New Zealand
Filed Sep. 21, 1982, Ser. No. 420,919
Claims priority, application New Zealand, Apr. 30, 1982, 200465
Term of patent 14 years
U.S. Cl. D21—191

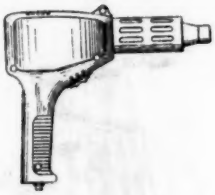
279,811
ERGOMETER
Shinroku Nakao, Kanagawa; Yoshiyasu Ishii, and Kenshun Ishii, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Mar. 26, 1984, Ser. No. 593,350
Claims priority, application Japan, Jan. 11, 1984, 59-429
Term of patent 14 years
U.S. Cl. D21—194

279,812
BARREL FOR FIREARMS
Vito Cellini, 3115 Old Ranch Rd., San Antonio, Tex. 78217
Filed Mar. 2, 1983, Ser. No. 471,484
Term of patent 14 years
U.S. Cl. D22—7

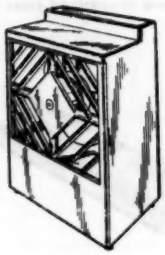


279,813
ARROWHEAD
Leo C. Palizzolo, 3928 Bonsai Pl., Castro Valley, Calif. 94546
Filed Dec. 9, 1982, Ser. No. 436,637
Term of patent 14 years
U.S. Cl. D22—12

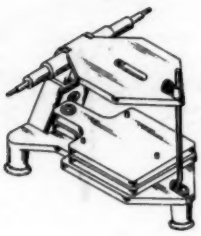
279,814
HOT AIR GUN
Jack Gaines, Long Beach, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Oct. 18, 1982, Ser. No. 435,082
Term of patent 14 years
U.S. Cl. D23—77



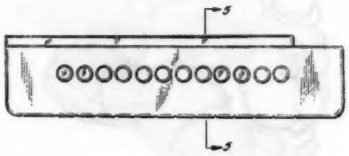
279,815
PORTABLE BATTERY POWERED HUMIDIFIER OR THE LIKE
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Jul. 14, 1982, Ser. No. 398,284
Term of patent 14 years
U.S. Cl. D23—146



279,816
DENTAL ARTICULATOR
John W. Mitchell, Sr., 1701 W. 168th St., Gardena, Calif. 90247
Filed Jun. 4, 1982, Ser. No. 385,044
Term of patent 14 years
U.S. Cl. D24—10



279,817
IMMUNOASSAY TEST SLIDE
Anthony B. Chen, Hayward; Richard A. Harte, Redwood City, and Nancy K. Kaufman, Belmont, all of Calif., assignors to Daryl Laboratories, Inc., Santa Clara, Calif.
Filed Jul. 19, 1982, Ser. No. 399,855
Term of patent 14 years
U.S. Cl. D24—29



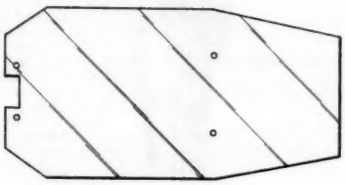
279,818
HEATING PAD
Randall C. Douglas, 60 Walnut Ave., Takoma Park, Md. 20912
Filed Jun. 10, 1982, Ser. No. 387,021
Term of patent 14 years
U.S. Cl. D24—36

279,819
COMBINED FLUORESCENT LAMP AND FLASHLIGHT INCORPORATING AN EMERGENCY BEACON
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Dec. 16, 1982, Ser. No. 450,461
Claims priority, application United Kingdom, Aug. 3, 1982, 1008103
Term of patent 14 years
U.S. Cl. D26—42

279,820
COMBINED TORCH AND LANTERN
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Dec. 16, 1982, Ser. No. 450,216
Claims priority, application United Kingdom, Oct. 13, 1982, 1 009 239
Term of patent 14 years
U.S. Cl. D26—42

279,821
COMBINED LANTERN AND TORCH
Lai K. Ma, Kowloon, Hong Kong, assignor to Sonca Industries Limited, Kowloon, Hong Kong
Filed Dec. 20, 1982, Ser. No. 451,326
Claims priority, application United Kingdom, Jun. 21, 1982, 1007341
Term of patent 14 years
U.S. Cl. D26—42

279,822
LUMINAIRE SHIELD
Phillip L. Wheeler, 24706 Clarington Dr., Laguna Hills, Calif. 92653
Filed Sep. 30, 1982, Ser. No. 430,932
Term of patent 14 years
U.S. Cl. D26—118



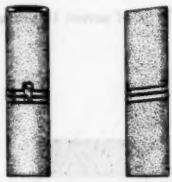
279,823
SWIVEL MOUNT FOR PORTABLE LAMP
John C. Parker, Tyler; Norman L. Terry, and Bud W. Lester, both of Jacksonville, all of Tex., assignors to Teknovation, Inc., Jacksonville, Tex.
Filed Aug. 23, 1982, Ser. No. 410,537
Term of patent 14 years
U.S. Cl. D26—140

279,824
RAZOR HANDLE
Hans Halm, Herne, Fed. Rep. of Germany, assignor to Wilkinson Sword GmbH, Solingen, Fed. Rep. of Germany
Filed Sep. 19, 1983, Ser. No. 533,710
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 5 MR 9352
Term of patent 14 years
U.S. Cl. D28—48

279,825
ELECTRIC SHAVER
Toshio Takizawa, Matsumoto, Japan, assignor to Izumi Seimitsu Kogyo Kabushiki, Matsumoto, Japan
Filed Jul. 29, 1983, Ser. No. 518,809
Claims priority, application Japan, Jan. 31, 1983, 58-3550
Term of patent 14 years
U.S. Cl. D28—50

279,826
COMBINED TOOTHPICK AND FLOSS HOLDER
Paul Schindler, Wolfensberg 1291, CH-9113 Degersheim, Switzerland
Filed Aug. 17, 1982, Ser. No. 409,042
Term of patent 14 years
U.S. Cl. D28—64

279,827
LIPSTICK CASE
Marcel Buchet, Paris, France, assignor to L'Oreal, S.A., Paris, France
Filed May 17, 1983, Ser. No. 495,477
Term of patent 14 years
U.S. Cl. D28—85



279,828
SLIM LINE LIPSTICK CASE
Marcel Buchet, Paris, France, assignor to L'Oreal, S.A., Paris, France
Filed May 17, 1983, Ser. No. 495,476
Term of patent 14 years
U.S. Cl. D28—85

279,829
SADDLE RACK
Richard P. Bartholomew, 2321 S. Santa Fe Ave., Vista, Calif. 92083
Filed Mar. 3, 1983, Ser. No. 471,778
Term of patent 14 years
U.S. Cl. D30—45

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF JULY, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. J. Antunes & Co.: *See*—
Miller, Dye O., 4,530,276, Cl. 99-386.000.

A/S Kongsberg Vapenfabrikk: *See*—
Mowill, Rolf J., 4,530,639, Cl. 415-98.000.

A. S. Laboratories, Inc.: *See*—
Aisenberg, Sol; and Stein, Martin L., 4,530,750, Cl. 204-298.000.

A V L Gesellschaft Fur Verbrennungskraftmaschinen Und Messtechnik M.B.H.: *See*—
Feichtinger, Gerhard, 4,530,314, Cl. 123-41.740.

Abbey, Harold G. Flow regulating carburetors. 4,530,805, Cl. 261-53.000.

Abe, Masahiro: *See*—
Hirai, Kiyomiki; Takeuchi, Koji; Ito, Nobuo; and Abe, Masahiro, 4,530,991, Cl. 528-123.000.

Abe, Yoshiaki, to Kao Corporation. Hair treatments. 4,530,829, Cl. 424-70.000.

Abelitis, Andris: *See*—
Herchenbach, Horst; and Abelitis, Andris, 4,530,661, Cl. 432-106.000.

Abendroth, Paul: *See*—
Mathes, Josef; Abendroth, Paul; Holl, Roland; and Seikel, Wolfgang, 4,530,283, Cl. 101-230.000.

Abraham, Leonard G., to GTE Laboratories Incorporated. Capacitor array. 4,531,113, Cl. 340-347.00C.

AccuSpray, Inc.: *See*—
Muck, Jack E., 4,530,469, Cl. 239-569.000.

ACI Australia Limited: *See*—
Powell, Roger M.; Marshall, Steven; and Waterworth, Philip D., 4,530,202, Cl. 53-426.000.

Adachi, Hiroyuki, to Canon Kabushiki Kaisha. Cleaning device. 4,530,594, Cl. 355-15.000.

Adamek, David J., to Champion International Corporation. Sift resistant economy seal carton. 4,530,461, Cl. 229-37.00R.

Adams, Charles T.: *See*—
Ryan, Robert C.; Adams, Charles T.; and Washecheck, Don M., 4,530,911, Cl. 502-74.000.

Adams, Gary V.; Anderson, Scott R.; and Lauritzen, Donald R., to Morton Thiokol Inc. Aluminum inflator with steel center-tie. 4,530,516, Cl. 280-741.000.

Adams, John N., to Xerox Corporation. Xerographic copying apparatus having means to reduce contamination of optical components. 4,530,589, Cl. 355-3.00R.

Adams, Ronald O., to Santiam O. Adams. Fountain toothbrush. 4,530,369, Cl. 132-84.00B.

Adamski, Maximillian; Jenkins, David C.; and Kosrow, Robert L., to Union Special Corporation. Guidance system for a workpiece transfer apparatus. 4,530,295, Cl. 112-121.120.

Aderans Co., Ltd.: *See*—
Nemoto, Nobuo, 4,530,810, Cl. 264-222.000.

Adkin, Francis W. Amplifier suitable for low supply voltage operation. 4,531,100, Cl. 330-290.000.

Agai, Bela: *See*—
Toke, Laszlo ; Agai, Bela; Bitter, Istvan; Pungor, Erno; Szepesvary nee Toth, Klara; Lindner, Erno; Horvath, Maria; and Havas, Jeno, 4,531,007, Cl. 549-351.000.

Aiba, Yoshiro: *See*—
Sugie, Masuo; Kurihara, Koji; Aiba, Yoshiro; Komatsu, Nobiru; Ootuka, Haruo; and Nishikido, Kaoru, 4,530,864, Cl. 428-35.000.

Air Products and Chemicals, Inc.: *See*—
Kadi, Frank J., 4,530,213, Cl. 62-55.500.
Kadi, Frank J., 4,530,233, Cl. 73-23.000.

Aisenberg, Sol; and Stein, Martin L., to A. S. Laboratories, Inc. Apparatus for coating optical fibers. 4,530,750, Cl. 204-298.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Akagi, Motonobu; Kawabata, Yasuhiro; and Hattori, Kyo, 4,530,374, Cl. 137-625.300.
Oguma, Tomio; and Hayakawa, Seiji, 4,530,339, Cl. 123-561.000.

Ajinomoto Co., Inc.: *See*—
Hirai, Kiyomiki; Takeuchi, Koji; Ito, Nobuo; and Abe, Masahiro, 4,530,991, Cl. 528-123.000.

Akademiet for de Tekniske Videnskaber, Svejsecentralen: *See*—
Lund, Svend A.; Krarup, Peter; and Kristensen, Thorkild, 4,530,243, Cl. 73-633.000.

Akagi, Motonobu; Kawabata, Yasuhiro; and Hattori, Kyo, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidoshakogyo Kabushiki Kaisha. Linear motor-actuated flow control valve. 4,530,374, Cl. 137-625.300.

Akimoto, Koji: *See*—
Kojo, Hidehiko; and Akimoto, Koji, 4,530,947, Cl. 523-450.000.

Aktiebolaget SKF: *See*—
Stackling, Hakan, 4,530,610, Cl. 384-560.000.

Akzo N.V.: *See*—
Lutticken, Heinrich D.; and Cornelissen, Daniel R. W., 4,530,831, Cl. 424-89.000.

Akzona Incorporated: *See*—
White, Kenneth B., 4,530,937, Cl. 521-105.000.
White, Kenneth B., 4,530,938, Cl. 521-105.000.

Albano, Rocco V.: *See*—
Torres, John R.; and Albano, Rocco V., 4,531,214, Cl. 371-66.000.

Aleksandrow, Jerry. Self-regulated energy saving refrigeration circuit. 4,530,219, Cl. 62-503.000.

Alexander, Delores J.: *See*—
Kordomenos, Panagiotis I.; Kurple, Kenneth R.; and Alexander, Delores J., 4,530,976, Cl. 525-440.000.

Alexander, Ian J., to Scott Bader Company Limited. Elastomer modified unsaturated polymers. 4,530,962, Cl. 525-31.000.

Allen, John J.; and Meitl, Harold G., to J. I. Case Company. Moveable filler assembly. 4,530,537, Cl. 296-1.00C.

Allied Corporation: *See*—
Buike, James W.; and Tomala, Ambrose, 4,530,413, Cl. 180-79.100.
Czaban, John D.; Cormier, Alan D.; and Legg, Kenneth D., 4,531,088, Cl. 324-71.100.
Harvey, Bruce J.; Laurent, Harold J.; and Pauwels, Michael A., 4,530,332, Cl. 123-481.000.
Kolc, Jaroslav F.; Swerdloff, Michael D.; Rogic, Milorad M.; Hendrickson, Larry L.; and Van Der Puy, Michael, 4,530,714, Cl. 71-28.000.
Rauch, Burton S., 4,530,674, Cl. 464-75.000.
Ritsema, Irving R., 4,530,423, Cl. 188-73.390.

Alluto, Luigi; and Fancelli, Fabio, to Indesit Industrial Elettrodometici Italiana S.p.A. Defrosting device for a refrigerator. 4,530,217, Cl. 62-156.000.

Alps Electric Co., Ltd.: *See*—
Murata, Taneo, 4,531,032, Cl. 200-153.00J.

Altemark, Detlef; Sommers, Hans; and Weid, Manfred, to Ruhrgas Aktiengesellschaft. Burner. 4,530,656, Cl. 431-8.000.

Aluminium Pechiney: *See*—
Vives, Charles, 4,530,404, Cl. 164-467.000.

Aluminum Company of America: *See*—
Monks, Frank E., 4,530,230, Cl. 72-363.000.
Schlesinger, Allen H.; Hudson, L. Keith; and Fish, William M., 4,530,699, Cl. 23-301.000.
Shabel, Barrie S., 4,530,235, Cl. 73-81.000.
Wright, Kenton B., 4,530,659, Cl. 432-32.000.

Amano Pharmaceutical Co., Ltd.: *See*—
Yanaihara, Noboru; Sugiura, Nobuo; and Kashimoto, Kazuhisa, 4,530,836, Cl. 514-16.000.

Amano, Tadashi, to Konishiroku Photo Industry Co., Ltd. Image display system. 4,531,150, Cl. 358-76.000.

Amara, Susan G.: *See*—
Evans, Ronald M.; Swanson, Larry; Vale, Wylie W., Jr.; Rosenfeld, Michael G.; Amara, Susan G.; Brown, Marvin R.; and Rivier, Jean E. F., 4,530,838, Cl. 514-11.000.

Amerace Corporation: *See*—
Duve, Wolfgang, 4,531,016, Cl. 174-87.000.

American Cyanamid Co.: *See*—
Ley, David A.; and Cady, Susan M., 4,530,960, Cl. 524-555.000.
Nandagiri, Arun, 4,530,450, Cl. 222-402.100.

American Hospital Supply Corporation: *See*—
Haduch, Paul R.; and Rega, Anthony, 4,530,568, Cl. 350-96.260.
Iyengar, Mike; and Gallagher, Gail, 4,530,344, Cl. 126-246.000.

American Industries, Inc.: *See*—
Baker, Ronald D., 4,531,179, Cl. 362-371.000.

American Optical Corporation: *See*—
Jones, John A., 4,530,706, Cl. 55-275.000.

American Safety Equipment Corporation: *See*—
Hayden, Richard; and Neumann, Fred F., 4,530,540, Cl. 297-341.000.

AMP Incorporated: *See*—
Gingerich, David J.; Rose, William H.; Rupnik, David W.; and Shaffer, David T., 4,531,030, Cl. 200-68.200.
Meehan, Robert F.; Rose, William H.; and Shaffer, David T., 4,530,552, Cl. 339-17.0CF.
Weidler, Charles H., 4,530,560, Cl. 339-97.00R.

Ancra Corporation: *See*—
Nordstrom, Arnold B., 4,530,483, Cl. 248-500.000.

Anderson, John N.: *See*—
Santoso, Muljadi; and Anderson, John N., 4,530,881, Cl. 428-421.000.

Anderson, Robert L., to Storage Technology Corporation. Magnetic tape drive with adaptive servo. 4,531,166, Cl. 360-73.000.

Anderson, Scott R.: *See*—
Adams, Gary V.; Anderson, Scott R.; and Lauritzen, Donald R., 4,530,516, Cl. 280-741.000.

Andersson, Alf H., to Ingenjorsfirman Alf Andersson Handelsbolag. Method and apparatus for spreading and distributing a solid or liquid particulate material. 4,530,462, Cl. 239-7.000.

Andersson, Bror A. E.; and Lindblom, Ragnvald E. Impression tray for dental purposes. 4,530,662, Cl. 433-37.000.

Andert, Charles M.: *See*—
Corley, John E.; Andert, Charles M.; Geen, Joseph H.; Wells, Wesley G.; and Lark, Russell D., 4,530,625, Cl. 408-14.000.

Ando, Fumitaka: *See*—
Kijima, Takao; Maebayashi, Jiro; and Ando, Fumitaka, 4,530,513, Cl. 280-701.000.

Andrushkiw, Roman W.: *See*—
Andruszkiw, Walter; and Andrushkiw, Roman W., 4,530,638, Cl. 415-4.000.

Andruszkiw, Walter; and Andrushkiw, Roman W. Wind driven power generating apparatus. 4,530,638, Cl. 415-4.000.

Aoki, Hachiro: *See*—
Sakuranaka, Toru; and Aoki, Hachiro, 4,530,330, Cl. 123-449.000.

Aoki, Hatsuo: *See*—
Ikushima, Koichi; Tanaka, Hirokazu; Osamu, Ohe; Kino, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Arakawa, Akira; and Imanaka, Hiroshi, 4,530,845, Cl. 514-453.000.

Aoshima, Masaru: *See*—
Sato, Katsutoshi; Itoh, Susumu; and Aoshima, Masaru, 4,530,428, Cl. 193-40.000.

Aoyagi, Kenichi: *See*—
Namba, Yuzuru; and Aoyagi, Kenichi, 4,530,325, Cl. 123-308.000.

Aoyagi, Shoji: *See*—
Suzuki, Toshitake; Arai, Naoto; Aoyagi, Shoji; Saito, Toranosuke; Kitani, Masakatu; and Ishibashi, Takashi, 4,531,140, Cl. 346-209.000.

Aoyama, Yutaka: *See*—
Fukino, Masato; Yanai, Tokiyoshi; Yamaguchi, Hirotsugu; and Aoyama, Yutaka, 4,530,414, Cl. 180-142.000.

APITAL Produzioni Industriali S.p.A.: *See*—
Raspanti, Guiseppe; Fossati, Norberto; and Ferrari, Attilio, 4,530,950, Cl. 524-100.000.

Applegate, Merlin J.: *See*—
Forrest, Robert S.; Brouwer, Floyd; and Applegate, Merlin J., 4,530,162, Cl. 33-228.000.

APV Anderson Bros. Inc.: *See*—
Stohlquist, Roger H., 4,530,435, Cl. 209-592.000.

APX Group Inc.: *See*—
Main, Perry A., 4,530,231, Cl. 72-393.000.

Arai, Naoto: *See*—
Suzuki, Toshitake; Arai, Naoto; Aoyagi, Shoji; Saito, Toranosuke; Kitani, Masakatu; and Ishibashi, Takashi, 4,531,140, Cl. 346-209.000.

Arakawa, Akira: *See*—
Ikushima, Koichi; Tanaka, Hirokazu; Osamu, Ohe; Kino, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Arakawa, Akira; and Imanaka, Hiroshi, 4,530,845, Cl. 514-453.000.

Arakawa, Yoshio: *See*—
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,530,926, Cl. 514-214.000.

Arav, Ronnie A., to Beloit Corporation. Control of fluid pressure circuits. 4,530,371, Cl. 137-115.000.

ARC Technologies Systems Ltd.: *See*—
Zollner, Dieter; Lauterbach-Dammler, Inge; Taube, Thomas; Lades, Hans; Liebel, Siegfried; and Bauer, Hanns-Georg, 4,531,219, Cl. 373-101.000.

Arcuri, Luigi; Bertotti, Elvio; Carignani, Giancarlo; Cipriani, Aldo; Donato, Aldo; and Grossi, Giuseppe, to Snial Resine Poliestere S.p.A.; and Comitoto Nazionale Per L'Energia Nucleare. Composition of matter suitable for solidifying radioactive wastes, products based on said composition wherein radioactive wastes are solidified and process for obtaining said products. 4,530,783, Cl. 252-628.000.

Ares N.V. Amsterdam NL, Swiss Branch: *See*—
Nessi, Pierre; and Crausaz, Jacques, 4,530,366, Cl. 128-736.000.

Arika, Junji; Itabashi, Keiji; and Tamura, Yoshio, to Toyo Soda Manufacturing Co., Ltd. Process for preparation of L type zeolites. 4,530,824, Cl. 423-328.000.

Arisawa, Yasuo: *See*—
Nishizawa, Jun-ichi; Suzuki, Sohbe; Tamamushi, Takashige; and Arisawa, Yasuo, 4,531,156, Cl. 358-213.000.

Arkind, Kenneth D.: *See*—
Powers, Richard L.; and Arkind, Kenneth D., 4,531,130, Cl. 343-767.000.

Armaroli, Gianni: *See*—
Lodi, Oliviero; and Armaroli, Gianni, 4,530,633, Cl. 414-414.000.

Armbruster, Robert G.; and Scriver, Richard M., to Goodyear Tire & Rubber Company, The. Pneumatic tire with tread of medium vinyl polybutadiene/rubber blend. 4,530,959, Cl. 524-526.000.

Armstrong World Industries, Inc.: *See*—
Kauffman, William J.; and Wright, Ralph W., 4,530,856, Cl. 427-197.000.

Arpin, Rene , to Rhone-Poulenc Specialties Chimiques. Water-based lime dispersion paint. 4,530,954, Cl. 524-387.000.

ARR-Tech Manufacturing, Inc.: *See*—
Sela, Richard, 4,530,632, Cl. 414-35.000.

Arrow Oil Tools, Inc.: *See*—
Greenlee, Donald R.; and Kline, Albert E., 4,530,398, Cl. 166-123.000.

Arya, Satya P., to Ingersoll-Rand Company. Offset driver accessory. 4,530,409, Cl. 173-131.000.

Asahi Denka Kogyo K.K.: *See*—
Kojo, Hidehiko; and Akimoto, Koji, 4,530,947, Cl. 523-450.000.

Asahi Glass Company Ltd.: *See*—
Morozumi, Mitsuharu; Ito, Yasumichi; Hiramatsu, Takeshi; and Asai, Minoru, 4,530,970, Cl. 525-193.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Morimoto, Isao; Nakao, Masafumi; and Mori, Koichi, 4,531,183, Cl. 346-135.100.
Ohashi, Hiroyuki; Miyamoto, Shoichi; and Kurihara, Shigeru, 4,530,826, Cl. 423-376.000.
Shiraki, Toshinori; Yamori, Akio; and Morita, Hideo, 4,530,966, Cl. 525-89.000.
Shiraki, Toshinori; Yamori, Akio; and Morita, Hideo, 4,530,967, Cl. 525-89.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Suzuki, Takeomi, 4,531,054, Cl. 250-201.000.

Asai, Minoru: *See*—
Morozumi, Mitsuharu; Ito, Yasumichi; Hiramatsu, Takeshi; and Asai, Minoru, 4,530,970, Cl. 525-193.000.

Asea Aktiebolag: *See*—
Brogardh, Torgny, 4,531,230, Cl. 382-13.000.
Larsson, Jan, 4,531,041, Cl. 219-90.000.

ASEA-STAL AB: *See*—
Brannstrom, Roine, 4,530,207, Cl. 60-39.464.

Ashida, Akira, to Hitachi, Ltd. Clock derivation circuits. 4,531,223, Cl. 375-110.000.

Ashley, Michael J.; Greaves, Roy A.; and Wyatt, John G., to Dresser U.K. Ltd. Gas/liquid contact processes. 4,530,822, Cl. 423-242.000.

AT&T Bell Laboratories: *See*—
Beecher, Robert L., II, 4,531,176, Cl. 361-424.000.
Colton, John R.; Scordo, Dominick; and Simmons, David M., 4,531,024, Cl. 179-2.0TS.
Hallock, Gary W., 4,531,154, Cl. 358-148.000.
Johnson, David W., Jr.; and Robbins, Murray, 4,531,110, Cl. 338-22.00R.
Knauer, Scott C., 4,531,209, Cl. 370-56.000.
Miller, Anton J., 4,530,139, Cl. 29-25.350.

AT&T Technologies, Inc.: *See*—
Ganesan, Apparajan, 4,531,106, Cl. 333-173.000.

Atkinson, Alan W.; Hurst, David R.; and Somerfield, Kenneth T., to T&N Materials Research Limited. Housing for electrical or electronic equipment. 4,530,949, Cl. 523-512.000.

Atlantic Richfield Company: *See*—
Bourland, Larry G., 4,530,965, Cl. 525-67.000.
Wong, Boon; Morel, Don L.; and Grosvenor, Victor L., 4,531,015, Cl. 136-258.000.

August Hohnholz KG: *See*—
Melchior, Bernd, 4,530,806, Cl. 264-22.000.

Aujla, Sharanjit S., to Northern Telecom Limited. Minimum insertion force connector. 4,530,553, Cl. 339-17.0LC.

AUTOMATIK Apparate-Machinenbau H. Hench GmbH: *See*—
Philipp, Heinrich; Lettner, Horst H.; and Hunke, Friedrich, 4,530,649, Cl. 425-71.000.

Automation Industries, Inc.: *See*—
Balyasny, Marik; and Lovell, William F., 4,530,452, Cl. 225-96.000.
Burns, Edgar; Johnson, James W.; and Kimbrough, Adele R., 4,530,559, Cl. 339-90.00R.

Avtomobilny Zavod Imeni Leninskogo Komsomola: *See*—
Evlanov, Viktor I., 4,530,512, Cl. 280-661.000.

Aya, Masahiro; Yasui, Kazuomi; and Kamochi, Atsumi, to Nihon Tokushu Noyaku Seizo K.K. Synergistic herbicidal mixtures of substituted phenylsulfonylurea derivatives and benzthiazol-2-yl-oxyacetic acid N-methylanilide. 4,530,717, Cl. 71-90.000.

Azuma, Kazufumi; Nate, Kazuo; Nakatani, Mitsuo; Yokono, Hitoshi; and Endo, Takeshi, to Hitachi, Ltd. Photosensitive resin composition. 4,530,746, Cl. 204-159.130.

Baba, Yuko, to Nissan Motor Co., Ltd.; and Hashimoto Forming Kogyo Co., Ltd. Mold for molding wheel cover having spoke-like portions. 4,530,484, Cl. 249-56.000.

Babcock & Wilcox Company, The: *See*—
Schluderberg, Donald C., 4,530,814, Cl. 376-317.000.

Babson Bros. Co.: *See*—
Horky, John W., 4,530,370, Cl. 134-57.00R.

Badesh, Santokh B., to Xerox Corporation. Process for reclamation of high purity selenium from scrap alloys. 4,530,718, Cl. 75-121.000.

Bair, Kenneth W., to Burroughs Wellcome Co. Perylene derivatives. 4,530,800, Cl. 260-501.210.

Baker, Malcolm J.: *See*—
Stiff, Rodney A.; and Baker, Malcolm J., 4,530,293, Cl. 111-2.000.

Baker, Michael J.; and Hardwick, Geoffrey J., to British Gas Corporation. Gas-fired water heaters. 4,530,347, Cl. 126-360.00R.

Baker Oil Tools, Inc.: *See*—
Riddle, Harry W., 4,530,399, Cl. 166-173.000.

Baker, Ronald D., to American Industries, Inc. Light fixture. 4,531,179, Cl. 362-371.000.

Balch, Duane C., to Chartwell Corporation. Oil drainage and collection system. 4,530,421, Cl. 184-1.500.

Baltimore Aircoil Company, Inc.: *See*—
Cates, Robert E.; Harrison, Richard H., Jr.; and Carter, Thomas P., 4,530,804, Cl. 261-30.000.

Balyasny, Marik; and Lovell, William F., to Automation Industries, Inc. Apparatus for cleaving an optical fiber. 4,530,452, Cl. 225-96.000.
Banholzer, Guido: *See*—
Nyffeler, Heinz; and Banholzer, Guido, 4,530,521, Cl. 285-21.000.
Banker, Dennis C.; Montegari, Frank A.; and Norsworthy, John P., to International Business Machines Corporation. Push-pull Darlington current sink (PPDCS) logic circuit. 4,531,067, Cl. 307-454.000.
Bannon, Glen M.; Hardie-Muncy, Darlene A.; and Wauters, Ronald P., to General Foods Corporation. Method for producing a non-segregating instant stuffing mix and product thereof. 4,530,848, Cl. 426-293.000.
Bar-on, Yair; and Horn, Gavriel. Energy conservation circuit for standby operation. 4,531,237, Cl. 455-343.000.
Baron, Francis; Flandrois, Serge; and Pacault, Adolphe, to Centre National de la Recherche Scientifique. Battery with graphite-manganese chloride insertion compound. 4,530,888, Cl. 429-206.000.
Barriac, Jacques, to Societe d'Applications Generales d'Electricite et de Mecanique Sagem. Gyrocompass for sea vehicles. 4,530,164, Cl. 33-324.000.
Barriac, Jacques, to Societe d'Applications Generales d'Electricite et de Mecanique Sagem. Gyroscopic navigational installations. 4,530,237, Cl. 73-178.00R.
Barron, Edward R.; and Lastnik, Abraham L., to Multi-Tech Corporation. Body armor. 4,530,111, Cl. 2-2.500.
Bartos, Hubert: *See*—
Fink, Roland; Bartos, Hubert; Noschilla, Herbert; and Klingenstein, Walter, 4,530,391, Cl. 164-155.000.
Basf Aktiengesellschaft: *See*—
Buerkle, Ottmar; Schmidts, Kurt; Schneider, Alfred; and Schuett, Walter, 4,530,475, Cl. 242-199.000.
Gimpel, Juergen; Schwendemann, Volker; and Gulbins, Erich, 4,530,978, Cl. 525-528.000.
Mattner, Otto; Merger, Franz; and Towae, Friedrich, 4,530,796, Cl. 260-453.00P.
Mross, Wolf D.; Schwarzmann, Matthias; Plueckham, Juergen; and Dehler, Juergen, 4,530,910, Cl. 502-24.000.
Woerner, Frank P.; Reimann, Horst; Mahnke, Harald; Neumann, Peter; Turznik, Gerhard; and Kaeppel, Hanshelmut, 4,530,940, Cl. 521-124.000.
BASF Farben: *See*—
Ostertag, Werner; Dimroth, Peter; Wienand, Henning; Liedek, Egon; Knittel, Helmut; and Etzrodt, Gunter, 4,530,725, Cl. 106-298.000.
Battagin, Gian Piero: *See*—
Crutzen, Serge; Franzetti, Gian Aldo; and Battagin, Gian Piero, 4,530,241, Cl. 73-602.000.
Battelle Memorial Institute: *See*—
Nguyen, Van T.; Bellmann, Gunter; and Boussel, Francoise, 4,530,961, Cl. 524-832.000.
Bauer, Dan O.: *See*—
Tew, Sydney K.; and Bauer, Dan O., 4,530,487, Cl. 251-138.000.
Bauer, Hanns-Georg: *See*—
Zollner, Dieter; Lauterbach-Dammler, Inge; Taube, Thomas; Lades, Hans; Liebel, Siegfried; and Bauer, Hanns-Georg, 4,531,219, Cl. 373-101.000.
Baxter Travenol Laboratories, Inc.: *See*—
Brown, Richard I., 4,530,691, Cl. 494-45.000.
Bayer Aktiengesellschaft: *See*—
Halpaap, Reinhard; Pedain, Josef; Thoma, Wilhelm; and Grammel, Jurgen, 4,530,990, Cl. 528-53.000.
Kranz, Eckart; Buchel, Karl H.; Kraatz, Udo; Regel, Erik; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Lurssen, Klaus, 4,530,715, Cl. 71-76.000.
Beams, David M., to Dickey-john Corporation. Metal detector. 4,531,118, Cl. 340-684.000.
Beaujean, Joseph M. E., to Docdata BV. Optical medium. 4,531,136, Cl. 346-135.100.
Beaver, Richard N.; Evans, Kenneth R.; and Waters, Donald D., to Dow Chemical Company, The. Bonded asbestos diaphragms. 4,530,749, Cl. 204-296.000.
Beck, Lee R.: *See*—
Tice, Thomas R.; Lewis, Danny H.; Cowsar, Donald R.; and Beck, Lee R., 4,530,840, Cl. 514-179.000.
Beck, Paul. Disposable barbeque assembly. 4,530,343, Cl. 126-9.00A.
Becker, Philip D., to Buell Industries, Inc. Self-retaining nut and method of applying to a panel. 4,530,619, Cl. 403-406.000.
Bedford Engineering Co.: *See*—
Bradley, William P.; Herman, Michael; and Paltrow, Robert W., 4,530,730, Cl. 156-227.000.
Bradley, William P., 4,530,731, Cl. 156-227.000.
Beecher, Robert L., II, to AT&T Bell Laboratories. Cartridge having improved electrostatic discharge protection. 4,531,176, Cl. 361-424.000.
Beerman, Ronald J.: *See*—
Spamer, William S.; and Beerman, Ronald J., 4,530,548, Cl. 312-45.000.
Behrens, Frederick A.: *See*—
Thurber, Charles H., Jr.; Behrens, Frederick A.; and Hunton, John H., 4,530,476, Cl. 244-3.210.
Beilstein, Kurt H., to Hofmann GmbH. Condiment dispenser. 4,530,470, Cl. 241-169.100.
Belanger, Inc.: *See*—
Belanger, James A., 4,530,126, Cl. 15-97.00B.
Belanger, James A., to Belanger, Inc. Car washing apparatus. 4,530,126, Cl. 15-97.00B.
Bell, R. Richard, to International Jensen Incorporated. Optimizing antenna interface for automobile radio receivers. 4,531,234, Cl. 455-247.000.
Bellerive, Donald E.: *See*—
Moran, William; and Bellerive, Donald E., 4,530,497, Cl. 272-71.000.
Belletire, John L., to Pfizer Inc. Carboxylic acid therapeutic agents. 4,530,919, Cl. 562-467.000.
Bellmann, Gunter: *See*—
Nguyen, Van T.; Bellmann, Gunter; and Boussel, Francoise, 4,530,961, Cl. 524-832.000.
Beloit Corporation: *See*—
Arav, Ronnie A., 4,530,371, Cl. 137-115.000.
Ben-Gurion University of the Negev Research and Development Authority: *See*—
Trop, Moshe, 4,530,850, Cl. 426-584.000.
Benasutti, John E., to Burroughs Corp. Circuit change pin for printed wiring board. 4,530,551, Cl. 339-17.00C.
Bendix Limited: *See*—
Joseph, Ian N., 4,530,544, Cl. 303-22.00R.
Benfey, David P.: *See*—
Herz, Harold L.; Jobes, Sam S.; Jordan, John D.; Benfey, David P.; and Wheeler, William C., 4,531,181, Cl. 363-21.000.
Benichou, Alain; and Siguier, Max, to Societe Anonyme D'Explosifs et de Produits Chimiques & Max Siguier. Strings for tennis rackets and rackets equipped with same. 4,530,206, Cl. 57-250.000.
Berenyi nee Poldermann, Edit: *See*—
Rakoczi, Jozsef; Berenyi nee Poldermann, Edit; Fekete, Bela; Szekeres, Laszlo ; Papp, Gyula; and Keszthelyi nee Udvary, Eva, 4,530,923, Cl. 514-183.000.
Berge, Arvid: *See*—
Ugelstad, John; and Berge, Arvid, 4,530,956, Cl. 524-458.000.
Berger, James K., to Pioneer Research, Inc. Servowriter system for magnetic disc drives. 4,531,167, Cl. 360-77.000.
Berghaeuser, Gunter; Schell, Loni; and Frass, Werner, to Hoechst Aktiengesellschaft. Process for desensitizing diazo lithographic printing forms using desensitizing solution with light absorbing compound. 4,530,897, Cl. 430-302.000.
Bergheim, Hans; and Griep, Winfried, to Vaw Leichtmetall GmbH. Method of forming a pipe connection. 4,530,145, Cl. 29-458.000.
Berinson, Robert. Picture mount and system for hanging pictures. 4,530,482, Cl. 248-475.100.
Berkey Photo, Inc.: *See*—
Rejwan, Sasson, 4,530,176, Cl. 40-359.000.
Bernard McCartney Limited: *See*—
McCartney, Bernard, 4,530,620, Cl. 404-121.000.
Bertelsen, William R. Segmented air-track apparatus. 4,530,545, Cl. 305-16.000.
Bertholet, Raymond: *See*—
Hirsbrunner, Pierre; and Bertholet, Raymond, 4,530,799, Cl. 260-501.130.
Bertotti, Elvio: *See*—
Arcuri, Luigi; Bertotti, Elvio; Carignani, Giancarlo; Cipriani, Aldo; Donato, Aldo; and Grossi, Giuseppe, 4,530,783, Cl. 252-628.000.
Beutel, Rainer: *See*—
Simon, Ulrich; and Beutel, Rainer, 4,530,895, Cl. 430-145.000.
Bey, Roger. Attenuating rotating valve. 4,530,375, Cl. 137-625.320.
Beyer, Guenter; Hauptmann, Rudolf; and Peters, Rainer, to Siemens Aktiengesellschaft. Three-dimensional air space surveillance radar. 4,531,125, Cl. 343-7.900.
Bialecki, Adolph: *See*—
Zell, Warren E.; Imel, Charles E.; Saam, Richard D.; Hearst, Peter J.; Olah, Nicholas J.; Bialecki, Adolph; and Biggers, Rececca L., 4,530,131, Cl. 15-321.000.
Bianco, Tommaso: *See*—
Perri, Giulio C.; Bianco, Tommaso; and Piccirilli, Beniamino, 4,530,902, Cl. 435-105.000.
Biarnesen, Terry L.: *See*—
Rumage, Donald V.; and Biarnesen, Terry L., 4,530,419, Cl. 182-106.000.
BICC Public Limited Company: *See*—
Smith, Alan M.; and Taylor, Peter J., 4,530,566, Cl. 350-96.200.
Big-Inch Marine Systems, Inc.: *See*—
Dopyera, Emil E.; and Miller, Jack E., 4,530,526, Cl. 285-261.000.
Biggers, Rececca L.: *See*—
Zell, Warren E.; Imel, Charles E.; Saam, Richard D.; Hearst, Peter J.; Olah, Nicholas J.; Bialecki, Adolph; and Biggers, Rececca L., 4,530,131, Cl. 15-321.000.
Biogen N.V.: *See*—
Weissmann, Charles, 4,530,901, Cl. 435-70.000.
Biomatics Inc.: *See*—
Gardos, Ivan, 4,530,304, Cl. 118-66.000.
Biomedica Foscama Industria Chimico Farmaceutica S.p.A.: *See*—
Perri, Giulio C.; Bianco, Tommaso; and Piccirilli, Beniamino, 4,530,902, Cl. 435-105.000.
Birch, James R., to Dow Company, The. Continuous polymerization of water-miscible polymers. 4,530,979, Cl. 526-64.000.
Bird, Robert, to MacTaggert Scott (Holdings) Ltd. Apparatus for controlling hydroplanes of marine vessels. 4,530,303, Cl. 114-332.000.
Birnbreier, Hermann; and Haas, Helmut, to Brown, Boveri & CIE AG. Method for producing a thin film resistor. 4,530,852, Cl. 427-102.000.
Biryoukoff, Maura: *See*—
Vere , Bernard; Biryoukoff, Maura; and Mathevon, Paul, 4,530,146, Cl. 29-468.000.

Bisera, Jose; and Weil, Max H., to Institute of Critical Care Medicine. Monitor for intravenous injection system for detecting occlusion and/or infiltration. 4,530,696, Cl. 604-253.000.

Bitter, Istvan: *See*—
Toke, Laszlo ; Agai, Bela; Bitter, Istvan; Pungor, Erno; Szepesvary nee Toth, Klara; Lindner, Erno; Horvath, Maria; and Havas, Jeno, 4,531,007, Cl. 549-351.000.

Black & Decker Inc.: *See*—
Cuneo, Giuseppe, 4,530,624, Cl. 408-8.000.

Black, Donald; and Pirtle, James D., to Emhart Industries, Inc. Remote alarm system. 4,531,115, Cl. 340-539.000.

Blackston, Michael D.: *See*—
Heise, Stanley R.; Blackston, Michael D.; Zekich, Michael B.; and Parselle, John L. B., 4,530,183, Cl. 49-42.000.

Blandino Alamia, Antonio: *See*—
Vielmo, Paolo; Brighenti, Attilio; and Blandino Alamia, Antonio, 4,531,063, Cl. 290-53.000.

Blankinship, Thomas J., to Gearhart Industries Incorporated. Caliper tool using magnetostrictive displacement transducer. 4,530,161, Cl. 33-178.00E.

Bluestein, Leo I.; Crandell, Paul E.; Drake, David A.; Jedynak, Leo; and Simpson, Larry W., to Oak Industries Inc. Two level encripting of RF signals. 4,531,021, Cl. 178-22.080.

Bluestein, Leo I.: *See*—
Wechselberger, Anthony J.; Bluestein, Leo I.; Jedynak, Leo; Drake, David A.; and Simpson, Larry W., 4,531,020, Cl. 178-22.080.

Board, David B.; and Cooper, William J., to Diagnostic Equipment Development, Inc. Method and apparatus for diagnosing machine condition. 4,530,240, Cl. 73-593.000.

Board of Regents, The University of Texas System: *See*—
Munro, Mark S.; Quattrone, Alfred J.; Ellsworth, Steven R.; and Eberhart, Robert C., 4,530,974, Cl. 525-329.400.

Boart International Limited: *See*—
Holmberg, John M., 4,530,527, Cl. 285-382.400.

Boeing Company, The: *See*—
Gorges, Friedrich J., 4,530,443, Cl. 220-327.000.

Bogenschutz, Thomas M., to General Signal Corporation. Spread brake cylinder device. 4,530,422, Cl. 188-52.000.

Bohm, Martin; Kramer, Manfred; and Schwartz, Reinhard, to Robert Bosch GmbH. Electric control device for fuel injection pumps for internal combustion engines. 4,530,327, Cl. 123-357.000.

Boisbluche, Arsene G., to Sambuchi-Boisbluche et Cie. Isothermic wall with three dimensional framework and process of constructing same. 4,530,191, Cl. 52-309.700.

Bonebright, Mark E.; and Mehner, Everett C., to Cubic Corporation. Multiple-feed luneberg lens scanning antenna system. 4,531,129, Cl. 343-754.000.

Bonin, Demetrius J.: *See*—
Lewarchik, Ronald J.; Noren, Gerry K.; Metcalfe, Ronald; Bonin, Demetrius J.; and Poklacki, Erwin S., 4,530,977, Cl. 525-443.000.

Bonus, Thomas G. Electrical safety receptacle. 4,530,556, Cl. 339-75.00P.

Boog, Manfred; and Jakob, Werner, to Heraeus Quarzschmelze GmbH. Composite tubular body. 4,530,378, Cl. 138-109.000.

Borcenk, Frank; Forsythe, Jeffry A.; and Roe, Frank L., to Exxon Research and Engineering Co. Printhead mounting/demounting mechanism. 4,530,611, Cl. 400-175.000.

Borden, Inc.: *See*—
Williams, James H., 4,530,713, Cl. 71-28.000.

Borg-Warner Corporation: *See*—
Lamarche, Paul E., 4,530,673, Cl. 464-64.000.

Bork, Carl R., Jr.; Steiss, William C.; Tobbe, William P.; Shufflebarger, Earl D.; Matousek, Stephen; and Gardner, Thomas J., to Nupro Company. Pressure relief valve. 4,530,373, Cl. 137-516.290.

Bork, Robert L. Apparatus for supporting vehicle body parts. 4,530,492, Cl. 269-17.000.

Borman, Willem F. H.; and Semen, John, to General Electric Company. Enhancement of ethylene-vinyl acetate adhesion to polyester sheet by post-reaction. 4,530,878, Cl. 428-334.000.

Bormann, Gerhard, to Sandoz Ltd. 2(1H)-pyridinone derivatives, their preparation and pharmaceutical compositions containing them. 4,530,842, Cl. 514-344.000.

Bourland, Larry G., to Atlantic Richfield Company. Polymeric molding composition containing styrenic copolymer, polycarbonate and MBS polymer. 4,530,965, Cl. 525-67.000.

Boussel, Francoise: *See*—
Nguyen, Van T.; Bellmann, Gunter; and Boussel, Francoise, 4,530,961, Cl. 524-832.000.

Boyes, Adrian P., to Vickers plc. Device for use in a bottle filling head. 4,530,384, Cl. 141-95.000.

Bradley, William P.; Herman, Michael; and Paltrow, Robert W., to Bedford Engineering Co. Method of making envelope assemblies. 4,530,730, Cl. 156-227.000.

Bradley, William P., to Bedford Engineering Co. High speed method of making envelopes each with a separate enclosure. 4,530,731, Cl. 156-227.000.

Bradshaw, John: *See*—
Collington, Eric W.; Hallett, Peter; Wallis, Christopher J.; and Bradshaw, John, 4,530,925, Cl. 514-211.000.

Bradshaw, John F., Jr.: *See*—
Burnham, Charles A.; Bradshaw, John F., Jr.; Kaufman, David E.; Chesler, David A.; and Brownell, Gordon L., 4,531,058, Cl. 250-363.00S.

Braid, Milton, deceased (by Frangatos, Gerassimos, executor), to Mobil Oil Corporation. Phenol-hindered phenol borates and lubricant compositions containing same. 4,530,770, Cl. 252-49.600.

Brandes, Donald, to Transformation Union Aktiengesellschaft. Three-phase choke with a five-leg core. 4,531,108, Cl. 336-5.000.

Brandes, Wilhelm: *See*—
Kranz, Eckart; Buchei, Karl H.; Kraatz, Udo; Regel, Erik; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Lursen, Klaus, 4,530,715, Cl. 71-76.000.

Brandt, Walter A., III. Separable ski. 4,530,511, Cl. 280-603.000.

Brannstrom, Roine, to ASEA-STAL AB. Power plant with a fluidized bed combustion chamber. 4,530,207, Cl. 60-39.464.

Brashears, David F.; and Porter, Travis G. Burner apparatus. 4,530,657, Cl. 431-188.000.

Braun, Henry D. Apparatus for walking upon water. 4,530,668, Cl. 441-76.000.

Braun, Martin: *See*—
Hild, Berthold; Braun, Martin; and Munker, Max, 4,530,224, Cl. 72-15.000.

Brazier, Peter C., to Walk Off Mats Limited. Floor mat combination and detachably securable floor mat. 4,530,870, Cl. 428-95.000.

Break, Douglas G. Machine table fastener assembly. 4,530,493, Cl. 269-93.000.

Brehler, Robert: *See*—
Schmid, Eberhard; and Brehler, Robert, 4,531,086, Cl. 323-222.000.

Breslow, Jeffrey D.; Morrison, Howard J.; Ditton, Richard A.; Meyer, Steven M.; and Morrison, Robert S., to Marvin Glass & Associates. Domino, or the like, placing video game. 4,530,499, Cl. 273-1.0GC.

Brie, Richard; and Guidoux, Loic B. Y., to Telecommunications Radioelectriques et Telephoniques. Receiver for a data transmission modem, comprising an echo canceller and an equalizer. 4,531,220, Cl. 375-14.000.

Brierley, John M.; and Scott, Melvin, to Lever Brothers Company. Stable liquid detergent suspensions. 4,530,775, Cl. 252-128.000.

Brigham Young University: *See*—
Robins, Roland K.; and Srivastava, Prem C., 4,531,001, Cl. 536-55.000.

Brighenti, Attilio: *See*—
Vielmo, Paolo; Brighenti, Attilio; and Blandino Alamia, Antonio, 4,531,063, Cl. 290-53.000.

Brisken, Axel F., to General Electric Company. Transducer array for sector scan and doppler flow measurement applications. 4,530,363, Cl. 128-663.000.

British Columbia Research Council: *See*—
Yalpani, Manssur, 4,531,000, Cl. 536-30.000.

British Gas Corporation: *See*—
Baker, Michael J.; and Hardwick, Geoffrey J., 4,530,347, Cl. 126-360.00R.

British Petroleum Company p.l.c., The: *See*—
Gregory, Reginald; and Westlake, David J., 4,531,014, Cl. 585-415.000.

Brodmann, George L.; and Lawton, Ernest L., to PPG Industries, Inc. Warp sizing composition, sized warp strands and process. 4,530,876, Cl. 428-283.000.

Broekhuis, Antonius A., to Shell Oil Company. Process for the preparation of polymers comprising conjugated dienes and optionally monoalkenyl aromatic hydrocarbons. 4,530,985, Cl. 526-181.000.

Brogardh, Torgny, to Asea Aktiebolag. Optical digitizer/position measuring device. 4,531,230, Cl. 382-13.000.

Brooks, Donald G. Knife guard filler fingers. 4,530,204, Cl. 56-298.000.

Brouwer, Floyd: *See*—
Forrest, Robert S.; Brouwer, Floyd; and Applegate, Merlin J., 4,530,162, Cl. 33-228.000.

Brown, Boveri & CIE AG: *See*—
Birnbreier, Hermann; and Haas, Helmut, 4,530,852, Cl. 427-102.000.

Brown, Brent W., to Integrated Systems Engineering, Inc. Electromechanical discrete element and a large sign or display. 4,531,121, Cl. 340-764.000.

Brown, Marvin R.: *See*—
Evans, Ronald M.; Swanson, Larry; Vale, Wylie W., Jr.; Rosenfeld, Michael G.; Amara, Susan G.; Brown, Marvin R.; and Rivier, Jean E. F., 4,530,838, Cl. 514-11.000.

Brown, Neil L.: *See*—
Clemence, Francois; and Brown, Neil L., 4,530,932, Cl. 514-318.000.

Brown, Richard I., to Baxter Travenol Laboratories, Inc. Centrifuge with movable mandrel. 4,530,691, Cl. 494-45.000.

Brown, Ronald E.; and Grinwis, Jack M. Limb protective coverings. 4,530,350, Cl. 128-82.000.

Brown, Russell L. Expanding anchor fastener. 4,530,630, Cl. 411-340.000.

Brownell, Gordon L.: *See*—
Burnham, Charles A.; Bradshaw, John F., Jr.; Kaufman, David E.; Chesler, David A.; and Brownell, Gordon L., 4,531,058, Cl. 250-363.00S.

Brownell, Kendrick C., Jr.; and Scrutchin, Thomas W., Jr., to International Business Machines Corporation. Superposing graphic patterns. 4,531,120, Cl. 340-723.000.

Brun, Charles, to Union Siderurgique du Nord et de L'est de la France (Usinor). Process and installation for continuous manufacturing of an old (over-aged) steel band having a coating of ZN, Al or ZN-Al alloy. 4,530,858, Cl. 427-320.000.

Brunner, Josef: *See*—
Rock, Erich; and Brunner, Josef, 4,530,547, Cl. 308-3.800.

Brunswick Corporation: *See*—
Erickson, Arnold R.; Panzera, Carlino; and Tolokan, Robert P., 4,530,884, Cl. 428-608.000.
McCormick, Daniel F., 4,530,667, Cl. 440-75.000.
Brusen, Karl R., to Motorola, Inc. Diversity signal strength indicator and site selection apparatus for using same. 4,531,235, Cl. 455-273.000.
Brzezinski, Dorothy S., to Coilcraft, Inc. Method for making a solder joint and the solder joint made thereby. 4,530,563, Cl. 339-275.00B.
Bucchi, Renato, to ITALCEMENTI Fabgriche Riunite Cemento S.p.A. Installation for treating in long kilns with a half-dry process wet slurries of raw materials for their conversion into portland cement clinker. 4,530,651, Cl. 425-94.000.
Buchel, Karl H.: *See*—
Kranz, Eckart; Buchel, Karl H.; Kraatz, Udo; Regel, Erik; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Lurssen, Klaus, 4,530,715, Cl. 71-76.000.
Buck, Ollie G.; and Naylor, Floyd E. Asphalt composition. 4,530,652, Cl. 428-291.000.
Bucksbee, James H.; and Campany, Andrew D., to Lord Corporation. Compact low-frequency engine mounting. 4,530,491, Cl. 267-141.000.
Buell Industries, Inc.: *See*—
Becker, Philip D., 4,530,619, Cl. 403-406.000.
Bueno, Humberto E. Adjustable valve for faucet or shower head. 4,530,467, Cl. 239-407.000.
Buerkle, Ottmar; Schmidts, Kurt; Schneider, Alfred; and Schuett, Walter, to Basf Aktiengesellschaft. Magnetic tape cassette with windows. 4,530,475, Cl. 242-199.000.
Buike, James W.; and Tomala, Ambrose, to Allied Corporation. Electrical power assisted steering mechanism. 4,530,413, Cl. 180-79.100.
Bunge, Richard H.; French, James C.; Hurley, Timothy R.; Smitka, Tim A.; and Tunac, Josefino B., to Warner-Lambert Company. CL-1577 Antibiotic compounds and their production. 4,530,835, Cl. 424-117.000.
Bungener, John H., to Pelouze Scale Company. Alarm and reset circuit for a countdown timer. 4,530,607, Cl. 368-109.000.
Bunn-O-Matic Corporation: *See*—
Stover, Kenneth W., 4,531,046, Cl. 219-297.000.
Buri, Rudolf: *See*—
Nyffeler, Heniz; and Buri, Rudolf, 4,530,520, Cl. 285-21.000.
Burkhardt, Horst; Ernst, Alfons; and Dangschat, Holmer, to Dr. Johannes Heidenhain GmbH. Method and apparatus for reproducing a reference position in an incremental measuring device. 4,530,155, Cl. 33-1.00L.
Burkle, Erwin: *See*—
Eichlseder, Martin; and Burkle, Erwin, 4,530,605, Cl. 366-79.000.
Burnham, Charles A.; Bradshaw, John F., Jr.; Kaufman, David E.; Chesler, David A.; and Brownell, Gordon L., to Massachusetts General Hospital, The. Positron source position sensing detector and electronics. 4,531,058, Cl. 250-363.00S.
Burns, Edgar; Johnson, James W.; and Kimbrough, Adele R., to Automation Industries, Inc. Locking means for a plug and receptacle connector. 4,530,559, Cl. 339-90.00R.
Burroughs Corp.: *See*—
Benasutti, John E., 4,530,551, Cl. 339-17.00C.
Holmberg, Scott H., 4,531,144, Cl. 357-71.000.
Rau, William G.; and Wojtowicz, Edward A., 4,530,269, Cl. 89-1.140.
Burroughs Wellcome Co.: *See*—
Bair, Kenneth W., 4,530,800, Cl. 260-501.210.
Bush, Vincent N.: *See*—
Hiniker, Thomas K.; and Bush, Vincent N., 4,530,463, Cl. 239-71.000.
Butera, William J.; and Stucki, Peter, to International Business Machines Corp. Method for adaptively using a print ribbon in an impact printer. 4,530,612, Cl. 400-232.000.
Butler, Donald E.; Pávia, Michael R.; and Hershenson, Fred M., to Warner-Lambert Company. Benzotricyclic nitrogen-containing diones and their use in reversing electroconvulsive shock-induced amnesia. 4,530,929, Cl. 514-295.000.
Buxdel Pty. Limited: *See*—
Leong, Christopher, 4,530,440, Cl. 220-201.000.
Cadotte, Alan P.: *See*—
Guilford, Nigel G. H.; and Cadotte, Alan P., 4,530,292, Cl. 110-346.000.
Cady, Susan M.: *See*—
Ley, David A.; and Cady, Susan M., 4,530,960, Cl. 524-555.000.
Calhoun, Gloria J., to Calhoun, H. C., a part interest. Oil saving apparatus for use with well pump polish rod. 4,530,397, Cl. 166-84.000.
Calhoun, H. C.: *See*—
Calhoun, Gloria J., 4,530,397, Cl. 166-84.000.
Camdent Laboratories: *See*—
Campbell, Bruce T., 4,530,259, Cl. 76-101.00D.
Campany, Andrew D.: *See*—
Bucksbee, James H.; and Campany, Andrew D., 4,530,491, Cl. 267-141.000.
Campbell, Bruce T., to Camdent Laboratories. Home care denture grinding instrument. 4,530,259, Cl. 76-101.00D.
Camus, Jean-Paul, to CEM Compagnie Electro-Mecanique. Process and means to control the average heating power induced in a flat conducting product maintained electromagnetically in position without contact. 4,531,037, Cl. 219-10.750.
Canfield, Douglas M.; and Gialanella, Joseph, to Casso-Solar Corporation. Clip-mounted quartz tube electric heater. 4,531,047, Cl. 219-354.000.
Canon Kabushiki Kaisha: *See*—
Adachi, Hiroyuki, 4,530,594, Cl. 355-15.000.
Endo, Ichiro; Ogura, Shigetaro; and Ohno, Shigeru, 4,531,138, Cl. 346-140.00R.
Kasuya, Yukio; Yagasaki, Toshiaki; and Masuda, Shunichi, 4,530,593, Cl. 355-14.00R.
Kitamura, Takashi, 4,531,217, Cl. 372-50.000.
Kosugi, Masao; Konuki, Tadashi; and Iizuka, Kazuo, 4,530,587, Cl. 355-53.000.
Maeda, Masaya; Takimoto, Hiroyuki; and Kozuki, Susumu, 4,531,164, Cl. 360-33.100.
Okutsu, Kazuhisa; Momose, Katsumi; and Hiraga, Ryozo, 4,530,604, Cl. 356-401.000.
Yamada, Yasuyuki, 4,530,583, Cl. 354-224.000.
Yokomizo, Yoshikazu, 4,531,240, Cl. 455-607.000.
Canter, Joseph M.; and Shelton, William A., to Polaroid Corporation. Control circuit for electronic flash. 4,531,078, Cl. 315-151.000.
Carbon, Fred S., to F. S. Carbon Company. Confectionery grill having adjustable heating elements. 4,531,048, Cl. 219-525.000.
Carignani, Giancarlo: *See*—
Arcuri, Luigi; Bertotti, Elvio; Carignani, Giancarlo; Cipriani, Aldo; Donato, Aldo; and Grossi, Giuseppe, 4,530,783, Cl. 252-628.000.
Carlin, William W.; and Marzec, Debra S., to PPG Industries, Inc. Electrode and method of preparing same. 4,530,742, Cl. 204-95.000.
Carlsson, Halvard I. Method end an apparatus for packaging articles in individual wrappings. 4,530,101, Cl. 53-397.000.
Carlsson, Valdemar, to ITT Industries, Inc. Centrifugal pump impeller. 4,530,643, Cl. 416-144.000.
Caron, LaVerne A.; and Handley, Edward F., to International Harvester Company. Glow plug control circuit. 4,530,321, Cl. 123-179.00H.
Carter, Thomas P.: *See*—
Cates, Robert E.; Harrison, Richard H., Jr.; and Carter, Thomas P., 4,530,804, Cl. 261-30.000.
Casarcia, Dominick A. Ultrasonic bolt tensioner. 4,530,143, Cl. 29-407.000.
Cass, Lloyd D.: *See*—
Zuwala, Stanley M.; and Cass, Lloyd D., 4,530,748, Cl. 204-273.000.
Casso-Solar Corporation: *See*—
Canfield, Douglas M.; and Gialanella, Joseph, 4,531,047, Cl. 219-354.000.
Caterpillar Tractor Co.: *See*—
Gibson, Dennis H.; and Stockner, Alan R., 4,530,331, Cl. 123-450.000.
Meisel, Thomas C., Jr., 4,530,546, Cl. 305-39.000.
Vachon, Louis F., 4,530,141, Cl. 29-156.4WL.
Cates, Robert E.; Harrison, Richard H., Jr.; and Carter, Thomas P., to Baltimore Aircoil Company, Inc. Forced draft cross flow, free-plenum evaporative heat exchanger. 4,530,804, Cl. 261-30.000.
Cavitt, Michael B.; and Moore, Charles H., to Dow Chemical Company, The. Room temperature coating compositions containing hydrolyzed epoxy novolac resins. 4,530,948, Cl. 523-454.000.
Cecala, Andrew B.; and Volkwein, Jon C., to United States of America, Interior. Self-adjusting cap lamp bracket. 4,530,112, Cl. 2-209.200.
CEM Compagnie Electro-Mecanique: *See*—
Camus, Jean-Paul, 4,531,037, Cl. 219-10.750.
Centre National de la Recherche Scientifique: *See*—
Baron, Francis; Flandrois, Serge; and Pacault, Adolphe, 4,530,888, Cl. 429-206.000.
Ceskoslovenska akademie ved: *See*—
Zverina, Karel; Tluchor, Denek; Szabo, Josef; Polidor, Jaromir; and Kroupa, Petr, 4,531,043, Cl. 219-121.0PP.
Cetus Corporation: *See*—
Shaked, Ze'ev; and Wolfe, Sidney N., 4,530,787, Cl. 260-112.00R.
Champion International Corporation: *See*—
Adamek, David J., 4,530,461, Cl. 229-37.00R.
Lillibridge, Harold R.; and Sullivan, John, 4,531,038, Cl. 219-10.810.
Chang, Bong H.: *See*—
Ritchie, Joseph M.; Chang, Bong H.; and Sosnowski, John, 4,530,755, Cl. 208-96.000.
Chang, Clarence D.; and Miale, Joseph N., to Mobil Oil Corporation. Catalysis over activated high silica zeolites. 4,530,756, Cl. 208-111.000.
Chang, Dale U., to Ford Motor Company. Method of laser soldering. 4,531,044, Cl. 219-121.0LM.
Chang, Pei K., to Stauffer Chemical Company. Oil seed proteins evidencing improved functionality. 4,530,788, Cl. 260-123.500.
Chang, Raymond S. L.: *See*—
Monaghan, Richard L.; Goetz, Michael A.; and Chang, Raymond S. L., 4,530,790, Cl. 260-239.30P.
Chapman, Harry A.: *See*—
Ladewski, Chester T.; Chapman, Harry A.; and Johnston, Jeffrey J., 4,531,215, Cl. 371-67.000.
Charon, Marie-Helene; Fromageot, Pierre; and Van Chuong, Paul P., to Commissariat a l'Energie Atomique. Peptide derivatives, their preparation process and their pharmaceutical use. 4,530,837, Cl. 514-18.000.
Chartwell Corporation: *See*—
Balch, Duane C., 4,530,421, Cl. 184-1.500.
Chatterjea, Probir K., to Dresser Industries, Inc. Pilot valve including a hydraulically actuated detent. 4,530,376, Cl. 137-636.100.
Chattha, Mohinder S.: *See*—
Theodore, Ares N.; and Chattha, Mohinder S., 4,530,957, Cl. 524-504.000.
Chauquet, Jacques, to Etablissments J. M. Chauquet. Gauge for testing the depth of a hole. 4,530,158, Cl. 33-169.00B.

Chaussy, Christian: *See—*
Forssmann, Bernd; Wess, Othmar; Zech, Hendrik; and Chaussy, Christian, 4,530,358, Cl. 128-328.000.

Chaviers, Wallace M.: *See—*
Whatley, David L.; and Chaviers, Wallace M., 4,530,645, Cl. 417-399.000.

Chemische Fabrik Stockhausen GmbH: *See—*
Hubner, Wolfgang; Klein, Helmut; Goldacker, Erhard; and Schrorers, Otto, 4,530,943, Cl. 523-318.000.

Chemplex Company: *See—*
Pullukat, Thomas J.; and Hoff, Raymond E., 4,530,912, Cl. 502-104.000.
Pullukat, Thomas J.; and Hoff, Raymond E., 4,530,913, Cl. 502-104.000.

Chen, Jason K. Soap basket. 4,530,479, Cl. 248-309.100.

Chesler, David A.: *See—*
Burnham, Charles A.; Bradshaw, John F., Jr.; Kaufman, David E.; Chesler, David A.; and Brownell, Gordon L., 4,531,058, Cl. 250-363.00S.

Chikaraishi, Takayo; and Itoh, Hiroshi, to Nissan Motor Company, Limited. Sliding type door assembly. 4,530,184, Cl. 49-213.000.

Chittick, Donald E.: *See—*
Fetters, Wayne A.; and Chittick, Donald E., 4,530,702, Cl. 48-209.000.

Chiu, Huan-Juei; and Chiu, Ming-Sheng. Flushing controller for toilet. 4,530,119, Cl. 4-324.000.

Chiu, Ming-Sheng: *See—*
Chiu, Huan-Juei; and Chiu, Ming-Sheng, 4,530,119, Cl. 4-324.000.

Chiyoda Chemical Engineering & Construction Co., Ltd.: *See—*
Shiroto, Yoshimi; Nakata, Shinichi; and Hashimoto, Hideki, 4,530,753, Cl. 208-68.000.
Shiroto, Yoshimi; Nakata, Shinichi; and Hashimoto, Hideki, 4,530,754, Cl. 208-68.000.

Chloride Group Public Limited Company: *See—*
Pearson, Ernest J., 4,530,153, Cl. 29-623.100.

Chodorow, Marvin: *See—*
Shaw, Herbert J.; Chodorow, Marvin; and Stokes, Loren F., 4,530,603, Cl. 356-345.000.

Chore-Time Equipment, Inc.: *See—*
Sheets, Keith A.; and Eby, Devon L., 4,530,308, Cl. 119-52.00B.

Christensen, Burton G.; and Ratcliffe, Ronald W., to Merck & Co., Inc. 6- And 6,6-disubstituted-3-substituted amino-1-azabicyclo-[3.2.0]hept-2-en-7-one-2-carboxylic acid. 4,530,841, Cl. 514-210.000.

Christensen, Carl W.; and Isaacson, Calvin, to Shipley Company Inc. Photosensitive laminate. 4,530,896, Cl. 430-155.000.

Christenson, Roger M.; Scriven, Roger L.; Jerabek, Robert D.; Koren, Jeffrey G.; and Johnson, Mark W., to PPG Industries, Inc. Pigment grinding vehicle. 4,530,945, Cl. 523-400.000.

Christian, Donald K. Separation device for single copy newspaper vendor. 4,530,444, Cl. 221-37.000.

Christian, Robert F., to Jude Engineering, Inc. Screw conveyer. 4,530,432, Cl. 198-662.000.

Christiansen, Jens H. Stove for round bottom vessels. 4,530,345, Cl. 126-40.000.

Chubb Lock & Safe Limited: *See—*
Harper, Barrie S., 4,530,222, Cl. 70-364.00R.

Chung, Kah-Seng; and Zegers, Leo E., to U.S. Philips Corporation. Premodulation filter for generating a generalized tamed frequency modulated signal. 4,531,221, Cl. 375-60.000.

Ciba-Geigy Corporation: *See—*
Martin, Henry; and Fricker, Urs, 4,530,716, Cl. 71-88.000.
Martin, Henry, 4,530,798, Cl. 260-465.00E.
Polony, Rudolf; Reinert, Gerhard; Holzle, Gerd; Pugin, Andre ; and Vonderwahl, Rodolphe, 4,530,924, Cl. 514-191.000.
Wilson, David; and Reverter, John A., 4,530,955, Cl. 524-434.000.

Cii Honeywell Bull (Societe Anonyme): *See—*
Faugeras, Philippe, 4,531,205, Cl. 369-13.000.

CIMA S.p.A.: *See—*
Sabbioni, Cesare, 4,530,626, Cl. 409-10.000.

Cipriani, Aldo: *See—*
Arcuri, Luigi; Bertotti, Elvio; Carignani, Giancarlo; Cipriani, Aldo; Donato, Aldo; and Grossi, Giuseppe, 4,530,783, Cl. 252-628.000.

City of Hope National Medical Center: *See—*
Rusnak, Miro, 4,530,486, Cl. 251-129.000.

Clarion Co., Ltd.: *See—*
Okamoto, Takeshi; Minagawa, Shoichi; and Niitsuma, Teruo, 4,531,107, Cl. 333-194.000.

Clarke, Bruce. Dog leash assembly. 4,530,310, Cl. 119-109.000.

Clavenna, Gaetano; Farina, Carlo; Pinza, Mario; and Pifferi, Giorgio, to I.S.F. Spa. Pharmaceutically active ursolic acid derivative. 4,530,934, Cl. 514-548.000.

ClearPlas Limited: *See—*
Connor, John, 4,530,571, Cl. 350-629.000.

Clemence, Francois; and Brown, Neil L., to Roussel Uclaf. 4-(1H-indol-3-yl)-α-methyl-piperidine-1-ethanol derivatives. 4,530,932, Cl. 514-318.000.

Clemens, Donald F.: *See—*
Whitehurst, Brooks M.; Clemens, Donald F.; King, Taylor; and Whitehurst, Garnett B., 4,530,735, Cl. 156-642.000.

Close, Donald H., to Hughes Aircraft Company. Method and apparatus for production of holographic optical elements. 4,530,564, Cl. 350-3.690.

Clyde, Robert A.; and Whipple, Andrew. Method for treating waste fluid with bacteria. 4,530,763, Cl. 210-610.000.

Codman & Shurtleff, Inc.: *See—*
Waters, George F., 4,530,577, Cl. 350-513.000.

Cogema and Framatome: *See—*
Vere , Bernard; Biryoukoff, Maura; and Mathevon, Paul, 4,530,146, Cl. 29-468.000.

Coilcraft, Inc.: *See—*
Brzezinski, Dorothy S., 4,530,563, Cl. 339-275.00B.

Cole, Charles F.: *See—*
Overton, Raymond C.; and Cole, Charles F., 4,530,372, Cl. 137-392.000.

Collington, Eric W.; Hallett, Peter; Wallis, Christopher J.; and Bradshaw, John, to Glaxo Group Limited. Aminocyclopentane esters and pharmaceutical formulations. 4,530,925, Cl. 514-211.000.

Collins, Doris A. Animal support harness. 4,530,309, Cl. 119-96.000.

Colonel, Shirley R. Method for stitching pattern. 4,530,665, Cl. 434-95.000.

Colorado State University Research Foundation: *See—*
Dunbar, Bohn D.; Niswender, Gordon D.; and Hudson, James M., 4,530,786, Cl. 260-112.00B.

Colton, John R.; Scordo, Dominick; and Simmons, David M., to AT&T Bell Laboratories. Multilocation video conference terminal including video switching contention control. 4,531,024, Cl. 179-2.0TS.

Columbia Chemical Corporation: *See—*
Rosenberg, William E., 4,530,741, Cl. 204-54.00R.

Combustion Engineering, Inc.: *See—*
Comparato, Joseph R., 4,530,290, Cl. 110-245.000.
Wysk, Stanley R., 4,530,291, Cl. 110-342.000.

Comitoto Nazionale Per L'Energia Nucleare: *See—*
Arcuri, Luigi; Bertotti, Elvio; Carignani, Giancarlo; Cipriani, Aldo; Donato, Aldo; and Grossi, Giuseppe, 4,530,783, Cl. 252-628.000.

Commissariat a l'Energie Atomique: *See—*
Charon, Marie-Helene; Fromageot, Pierre; and Van Chuong, Paul P., 4,530,837, Cl. 514-18.000.

Communication Intelligence Corporation: *See—*
Crane, Hewitt D.; Ostrem, John S.; and Edberg, Peter K., 4,531,231, Cl. 382-13.000.

Compagnie Industrielle des Telecommunications CIT-ALCATEL: *See—*
Roche, Georges; and Lantaires, Jacques, 4,530,152, Cl. 29-588.000.

Comparato, Joseph R., to Combustion Engineering, Inc. Apparatus for fluidizing a particulate material in a conveying gas. 4,530,290, Cl. 110-245.000.

Connor, John, to ClearPlas Limited. Mirror. 4,530,571, Cl. 350-629.000.

Conoco Inc.: *See—*
Overton, Raymond C.; and Cole, Charles F., 4,530,372, Cl. 137-392.000.

Conrad, Ulrich: *See—*
Gruber, Gerhard; Moser, Peter; Conrad, Ulrich; and Vlach, Jiri, 4,530,682, Cl. 474-133.000.

Consolidated Papers, Inc.: *See—*
Williams, Donald H., 4,530,692, Cl. 493-309.000.

Cook, George E., to CRC Welding Systems, Inc. Apparatus and method for sensing a workpiece with an electrical arc. 4,531,192, Cl. 364-513.000.

Cooper, William J.: *See—*
Board, David B.; and Cooper, William J., 4,530,240, Cl. 73-593.000.

Cordis Corporation: *See—*
Saulson, Stanley H.; and Wesner, Walter H., 4,530,368, Cl. 128-784.000.

Corley, John E.; Andert, Charles M.; Geen, Joseph H.; Wells, Wesley G.; and Lark, Russell D., to McDonnell Douglas Corporation. Hydraulic stop. 4,530,625, Cl. 408-14.000.

Cormier, Alan D.: *See—*
Czaban, John D.; Cormier, Alan D.; and Legg, Kenneth D., 4,531,088, Cl. 324-71.100.

Cornelissen, Daniel R. W.: *See—*
Lutticken, Heinrich D.; and Cornelissen, Daniel R. W., 4,530,831, Cl. 424-89.000.

Coulter Associates, Inc.: *See—*
Coulter, David C., 4,531,229, Cl. 381-68.000.

Coulter, David C., to Coulter Associates, Inc. Method and apparatus for improving binaural hearing. 4,531,229, Cl. 381-68.000.

Coutin, Pierre F.: *See—*
Mattei, Jean P.; and Coutin, Pierre F., 4,530,147, Cl. 29-525.000.

Cowsar, Donald R.: *See—*
Tice, Thomas R.; Lewis, Danny H.; Cowsar, Donald R.; and Beck, Lee R., 4,530,840, Cl. 514-179.000.

Crandell, Paul E.: *See—*
Bluestein, Leo I.; Crandell, Paul E.; Drake, David A.; Jedynak, Leo; and Simpson, Larry W., 4,531,021, Cl. 178-22.080.

Crane, Hewitt D.; Ostrem, John S.; and Edberg, Peter K., to Communication Intelligence Corporation. Method for distinguishing between complex character sets. 4,531,231, Cl. 382-13.000.

Cranston Machinery Company, Inc.: *See—*
Hargreaves, John E., 4,530,535, Cl. 294-82.240.

Crausaz, Jacques: *See—*
Nessi, Pierre; and Crausaz, Jacques, 4,530,366, Cl. 128-736.000.

CRC Welding Systems, Inc.: *See—*
Cook, George E., 4,531,192, Cl. 364-513.000.

Crehan & Fricke: *See—*
Kennedy, Richard B., 4,530,777, Cl. 252-182.000.

Crestmont Corporation: *See—*
Ringer, Billy R., Sr., 4,530,689, Cl. 493-410.000.

Crinquette, Andre : *See—*
Gauchet, Yves; Crinquette, Andre ; Martinet, Pascal; and Lestradet, Denis, 4,530,465, Cl. 239-127.000.

Cronin, Michael J., to Lockheed Corporation. Electric actuator system with hydraulic coupling as protection against mechanical jamming. 4,530,271, Cl. 91-509.000.

Crowley, Norman: *See—*
Fuchs, Gilbert; Crowley, Norman; and Wink, Randall, 4,530,729, Cl. 156-217.000.

Crutzen, Serge; Franzetti, Gian Aldo; and Battagin, Gian Piero, to European Atomic Energy Community (Euratom). Method of monitoring the identity and integrity of an object particularly a closed container. 4,530,241, Cl. 73-602.000.

Csomor, Katalin: *See—*
Machovich, Raymund; Nagy, Miklos; Gyorgyi nee Edelenyi, Judit; Horvath, Istvan; Low, Miklos; Csomor, Katalin; Karpati, Egon; Szporny, Laszlo ; and Kisfaludy, Lajos, 4,530,964, Cl. 525-61.000.

Csovari, Mihaly: *See—*
Czegledi, Bela; Csovari, Mihaly; Erdelyi, Miklos; Illi, Jozsef; Stocker, Lajos; Szoke, Attila; Szabo nee Mogyorosi, Katalin; Riederauer, Szilard; Urmossy, Miklos; Terenyi, Gyula; and Csurgai, Istvan, 4,530,819, Cl. 423-112.000.

Csurgai, Istvan: *See—*
Czegledi, Bela; Csovari, Mihaly; Erdelyi, Miklos; Illi, Jozsef; Stocker, Lajos; Szoke, Attila; Szabo nee Mogyorosi, Katalin; Riederauer, Szilard; Urmossy, Miklos; Terenyi, Gyula; and Csurgai, Istvan, 4,530,819, Cl. 423-112.000.

Cubic Corporation: *See—*
Bonebright, Mark E.; and Mehner, Everett C., 4,531,129, Cl. 343-754.000.

Cubic Western Data: *See—*
McCann, John C., 4,531,171, Cl. 360-130.300.

Cucchetto, Federico, to Enomec S.R.L. Bottle-holder pincers forming a link in a conveyor chain. 4,530,433, Cl. 198-695.000.

Cullick, Alvin S.; and Warner, Bert J., to Mobil Oil Corporation. Method and system for measuring properties of fluids. 4,530,234, Cl. 73-53.000.

Cuneo, Giuseppe, to Black & Decker Inc. Drill press with means for temporarily increasing power to the motor. 4,530,624, Cl. 408-8.000.

Currie, Neil L. Automotive exhaust system. 4,530,418, Cl. 181-227.000.

Cutchaw, John M. Apparatus for cooling high-density integrated circuit packages. 4,531,146, Cl. 357-82.000.

Cyclops Corporation: *See—*
Hadley, John F., 4,530,877, Cl. 428-305.500.

Czaban, John D.; Cormier, Alan D.; and Legg, Kenneth D., to Allied Corporation. Blood analysis. 4,531,088, Cl. 324-71.100.

Czegledi, Bela; Csovari, Mihaly; Erdelyi, Miklos; Illi, Jozsef; Stocker, Lajos; Szoke, Attila; Szabo nee Mogyorosi, Katalin; Riederauer, Szilard; Urmossy, Miklos; Terenyi, Gyula; and Csurgai, Istvan, to Tatabanvai Szenbanyak; and Mecseki Ercbanyaszati Vallalat. Process for reducing the iron. 4,530,819, Cl. 423-112.000.

Dagenhart, William K., to United States of America, Energy. Ion source with improved primary arc collimation. 4,531,077, Cl. 315-111.810.

Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See—*
Taniuchi, Akira; Nishibori, Setsuo; Komori, Hirohito; and Hayashi, Motoshige, 4,530,880, Cl. 428-402.000.

Daikin Kogyo Co., Ltd.: *See—*
Enjo, Naonori; Noguchi, Masahiro; and Ide, Satoshi, 4,530,773, Cl. 252-67.000.
Tatemoto, Masayoshi; Furukawa, Yasuyoshi; Tomoda, Masayasu; Oka, Masahiko; and Morita, Shigeru, 4,530,972, Cl. 525-276.000.

Daimler-Benz Aktiengesellschaft: *See—*
Gruber, Gerhard; Moser, Peter; Conrad, Ulrich; and Vlach, Jiri, 4,530,682, Cl. 474-133.000.

Dangschat, Holmer: *See—*
Burkhardt, Horst; Ernst, Alfons; and Dangschat, Holmer, 4,530,155, Cl. 33-1.00L.

Daniel, Wayne, to SW Daniel, Inc. Suppressor. 4,530,417, Cl. 181-223.000.

Daniels, John Y.: *See—*
Hendrix, James E.; Daniels, John Y.; and Jackson, Bobby D., 4,530,874, Cl. 428-266.000.

Daniels, Kenneth M. Read/write head-positioning apparatus for a magnetic recording disk drive unit. 4,531,169, Cl. 360-98.000.

Danley, Thomas J.; and Rey, Charles A., to Intersonics Incorporated. Loudspeaker with commutated coil drive. 4,531,025, Cl. 179-115.5VC.

Davies, James F.; Hight, Andrew T.; and Lee, Robert S., to Lever Brothers Company. Fabric washing process and detergent composition for use therein. 4,530,774, Cl. 252-108.000.

Day, Grant P.: *See—*
Prasad, Arun; and Day, Grant P., 4,530,664, Cl. 433-207.000.

Dayco Corporation: *See—*
Miranti, Joseph P., Jr., 4,530,680, Cl. 474-93.000.
Miranti, Joseph P., Jr., 4,530,684, Cl. 474-264.000.

De Cloet Ltd.: *See—*
De Cloet, Ben, 4,530,203, Cl. 56-27.500.

DEC International, Inc.: *See—*
Thompson, Paul D., 4,530,307, Cl. 119-14.490.

Decker, David E. Paper clip holder. 4,530,445, Cl. 221-198.000.

De Cloet, Ben, to De Cloet Ltd. Leaf distribution means. 4,530,203, Cl. 56-27.500.

Deere & Company: *See—*
Vogt, James L.; and Verhulst, Michael J., 4,531,027, Cl. 200-6.00A.
White, Gregory S., 4,530,405, Cl. 172-126.000.

Deering, Roland F.; Gowdy, Hugh W.; and Kelley, Arnold E., to Union Oil Company of California. Oil shale retorting process. 4,530,752, Cl. 208-11.00R.

De Fusco, Albert A.; and Nielsen, Arnold T., to United States of America, Navy. Preparation of a diaminotetranitronaphthalene. 4,531,013, Cl. 564-428.000.

Degussa Aktiengelleschaft: *See—*
Leuchtenberger, Wolfgang; Kula, Maria-Regina; Hummel, Werner; and Schutte, Horst, 4,530,903, Cl. 435-130.000.

Dehler, Juergen: *See—*
Mross, Wolf D.; Schwarzmann, Matthias; Plueckham, Juergen; and Dehler, Juergen, 4,530,910, Cl. 502-24.000.

Denaci, Herbert G., to Grumman Aerospace Corporation. Method of directing a close attack missile to a target. 4,530,270, Cl. 89-1.110.

deNora, Oronzio, to Oronzio deNora Impianti Elettrochimici S.p.A. Electrolysis cell. 4,530,743, Cl. 204-98.000.

Desjardins, Paul J.; Menon, Sathischandran; Milles, Maano; and Pawel, Hans E., to N.J. Institute of Technology; and University of Medicine and Dentistry. Apparatus for measuring facial swelling. 4,530,367, Cl. 128-777.000.

DeSoto, Inc.: *See—*
Lewarchik, Ronald J.; Noren, Gerry K.; Metcalfe, Ronald; Bonin, Demetrius J.; and Poklacki, Erwin S., 4,530,977, Cl. 525-443.000.

Dettmer, Dennis G.: *See—*
Snyder, Walter W; and Dettmer, Dennis G., 4,530,228, Cl. 72-349.000.

Devoe-Holbein International, N.V.: *See—*
DeVoe, Irving W.; and Holbein, Bruce E., 4,530,963, Cl. 525-54.100.

DeVoe, Irving W.; and Holbein, Bruce E., to Devoe-Holbein International, N.V. Insoluble chelating compositions. 4,530,963, Cl. 525-54.100.

Dewert, Heribert: *See—*
Holter, Heinz; Igelbuscher, Heinrich; Gresch, Heinrich; and Dewert, Heribert, 4,530,817, Cl. 422-122.000.

Dhabhar, Dadi J.; and Schmidt, Nicholas F., to Richardson-Vicks Inc. CMC/PEG containing hydrophilic denture adhesive. 4,530,942, Cl. 523-118.000.

Diagnostic Equipment Development, Inc.: *See—*
Board, David B.; and Cooper, William J., 4,530,240, Cl. 73-593.000.

DiCarlo, Carlton, to DiCarlo Pen Company. Slitter assembly. 4,530,154, Cl. 30-294.000.

DiCarlo Pen Company: *See—*
DiCarlo, Carlton, 4,530,154, Cl. 30-294.000.

Dickey-john Corporation: *See—*
Beams, David M., 4,531,118, Cl. 340-684.000.

Dickinson, John M. C.: *See—*
Stewart, William R.; Stewart, David B.; and Dickinson, John M. C., 4,530,133, Cl. 19-97.000.

Diemer, Peter, to Krupp-Koppers GmbH. Bridging operational shutdowns of the ammonia washer of a plant operating according to the semi-direct technique for the removal of ammonia from coking oven gas. 4,530,821, Cl. 423-238.000.

Diesel Kiki Company, Ltd.: *See—*
Ichinose, Toshio, 4,530,336, Cl. 123-502.000.
Sakuranaka, Toru; and Aoki, Hachiro, 4,530,330, Cl. 123-449.000.
Torizuka, Keizi, 4,530,335, Cl. 123-495.000.

Dieter, Lynn. Support collar for a trash bag. 4,530,533, Cl. 294-1.100.

Dimroth, Peter: *See—*
Ostertag, Werner; Dimroth, Peter; Wienand, Henning; Liedek, Egon; Knittel, Helmut; and Etzrodt, Gunter, 4,530,725, Cl. 106-298.000.

Director General of Agency of Industrial Science & Technology: *See—*
Jinda, Takuma; Matsuda, Toshikazu; and Sakamoto, Masanori, 4,530,993, Cl. 528-353.000.

Director-General of the Agency of Industrial Science and Technology: *See—*
Tanihara, Koichi; Tamai, Keiko; and Yasuda, Seiji, 4,530,768, Cl. 210-719.000.

Ditton, Richard A.: *See—*
Breslow, Jeffrey D.; Morrison, Howard J.; Ditton, Richard A.; Meyer, Steven M.; and Morrison, Robert S., 4,530,499, Cl. 273-1.0GC.

Dixon Automatic Tool, Inc.: *See—*
Dixon, Paul H., 4,530,446, Cl. 221-223.000.

Dixon, Paul H., to Dixon Automatic Tool, Inc. Machine for handling parts. 4,530,446, Cl. 221-223.000.

Docdata BV: *See—*
Beaujean, Joseph M. E., 4,531,136, Cl. 346-135.100.

Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See—*
Zaremba, Dieter, 4,530,313, Cl. 123-41.470.

Dr. Johannes Heidenhain GmbH: *See—*
Burkhardt, Horst; Ernst, Alfons; and Dangschat, Holmer, 4,530,155, Cl. 33-1.00L.
Nelle, Guenther, 4,530,157, Cl. 33-125.00R.

Doellinger, Rolf; and Schindler, Rudolf, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Apparatus for impregnating reinforcing fiber materials with a resinous binder material. 4,530,733, Cl. 156-441.000.

Donato, Aldo: *See—*
Arcuri, Luigi; Bertotti, Elvio; Carignani, Giancarlo; Cipriani, Aldo; Donato, Aldo; and Grossi, Giuseppe, 4,530,783, Cl. 252-628.000.

Donges, Reinhard; and Horn, Klaus, to Hoechst Aktiengesellschaft. Photopolymerizable mixture and photopolymerizable copying material prepared therewith. 4,530,747, Cl. 204-159.160.

Donomoto, Tadashi; Tatematsu, Yoshiaki; and Tanaka, Atsuo, to Toyota Jidosha Kabushiki Kaisha. Silicon carbide whisker composite material with low non whisker particle content and method of manufacture thereof. 4,530,875, Cl. 428-283.000.

Dopyera, Emil E.; and Miller, Jack E., to Big-Inch Marine Systems, Inc. Swivel coupling element. 4,530,526, Cl. 285-261.000.

Dorn, Friedrich-Wilhelm: *See*—
Wolter, Manfred; Dorn, Friedrich-Wilhelm; Heymer, Gero; and Stephan, Hans-Werner, 4,530,769, Cl. 210-769.000.

Dornier System GmbH: *See*—
Forssmann, Bernd; Wess, Othmar; Zech, Hendrik; and Chaussy, Christian, 4,530,358, Cl. 128-328.000.

Douglas-Hamilton, Diarmaid H., to Hamilton Farm. Method and device for cooling, preserving and safely transporting biological material. 4,530,816, Cl. 422-1.000.

Dow Chemical Company, The: *See*—
Beaver, Richard N.; Evans, Kenneth R.; and Waters, Donald D., 4,530,749, Cl. 204-296.000.
Cavitt, Michael B.; and Moore, Charles H., 4,530,948, Cl. 523-454.000.
Esneault, Calvin P.; Fuentes, Ricardo, Jr.; and Meiske, Larry A., 4,530,915,-Cl. 502-115.000.
Freedman, Harold H., 4,530,905, Cl. 435-177.000.
Jones, Mark B.; and Fowler, Allan E., 4,530,704, Cl. 55-48.000.
Koster, Robert A.; and Traugott, Tom D., 4,530,973, Cl. 525-310.000.
Rickle, Gregory K., 4,530,939, Cl. 521-110.000.
Tasset, Emmett L., 4,530,601, Cl. 356-36.000.
Turner, Robert B.; Peffley, Richard D.; and Vanderhider, James A., 4,530,941, Cl. 521-176.000.

Dow Company, The: *See*—
Birch, James R., 4,530,979, Cl. 526-64.000.

Dow Corning Corporation: *See*—
Homan, Gary R.; and Stickles, David L., 4,530,882, Cl. 428-452.000.

Dowdle, Dean M.: *See*—
Nourse, Gary E.; and Dowdle, Dean M., 4,531,117, Cl. 340-572.000.

Down, William H., to Electrovert Ltd. Wave-soldering of printed circuit boards. 4,530,457, Cl. 228-180.200.

Drackett Company, The: *See*—
Richards, Randall G., 4,530,118, Cl. 4-228.000.

Draftex Development AG: *See*—
Ginster, Helmut, 4,530,192, Cl. 52-397.000.

Drahnak, Timothy J., to Minnesota Mining and Manufacturing Company. Radiation activated addition reaction. 4,530,879, Cl. 428-352.000.

Drake, David A.: *See*—
Bluestein, Leo I.; Crandell, Paul E.; Drake, David A.; Jedynak, Leo; and Simpson, Larry W., 4,531,021, Cl. 178-22.080.
Wechselberger, Anthony J.; Bluestein, Leo I.; Jedynak, Leo; Drake, David A.; and Simpson, Larry W., 4,531,020, Cl. 178-22.080.

Drake, Derek J.: *See*—
Stanley, Haydn T.; and Drake, Derek J., 4,530,849, Cl. 426-439.000.

Dreckmann, Harald J., to Permag Corporation. Exposed ferrite core impeder. 4,531,035, Cl. 219-8.500.

Drees, Terry P.: *See*—
Knapp, Larry I.; and Drees, Terry P., 4,530,883, Cl. 428-503.000.

Dresser Industries, Inc.: *See*—
Chatterjea, Probir K., 4,530,376, Cl. 137-636.100.

Dresser U.K. Ltd.: *See*—
Ashley, Michael J.; Greaves, Roy A.; and Wyatt, John G., 4,530,822, Cl. 423-242.000.

Drews, Reinhold E.; Fisher, Almon P.; Hermanson, Herman A.; and Pond, Stephen F., to Xerox Corporation. Thermoremanent magnetic imaging method. 4,531,137, Cl. 346-74.400.

Drews, Ulrich; Mezger, Manfred; Schmidt, Bernhard; Seeger, Karl; Sohner, Gerhard; and Roozenbeek, Herman, to Robert Bosch GmbH. Electronic engine control system with emergency operation mode. 4,531,190, Cl. 364-431.110.

Driggers, Robert H. Log roller. 4,530,510, Cl. 280-47.170.

Drzala, Christopher W.: *See*—
Whitlock, Jonathan B.; and Drzala, Christopher W., 4,531,102, Cl. 331-1.00A.

Duarte, Luiz R. Method for healing bone fractures with ultrasound. 4,530,360, Cl. 128-419.00F.

Duffer, Paul F.; Franz, Helmut; and Kelly, Joseph D., to PPG Industries, Inc. Acidified powdered interleaving. 4,530,889, Cl. 428-326.000.

Dugua, Jacques, to Produits Chimiques Ugine Kuhlmann. Uranium peroxide in the form of spherical particles having good flowability and processes for preparing same. 4,530,823, Cl. 423-260.000.

Dullea, Leonard V.; Loughridge, Frederick A.; and Johnson, Stephen G., to GTE Products Corporation. Low-pressure arc discharge lamp having parallel discharge tubes with an arc-containing interconnecting channel; and method of manufacturing same. 4,530,710, Cl. 65-56.000.

Dunbar, Bohn D.; Niswender, Gordon D.; and Hudson, James M., to Colorado State University Research Foundation. Antibody for the detection and quantification of atrazine. 4,530,786, Cl. 260-112.00B.

Du Pont de Nemours, E. I., and Company: *See*—
Krespan, Carl G., 4,531,011, Cl. 560-184.000.
Malhotra, Satish C., 4,530,981, Cl. 526-73.000.
Moberg, William K., 4,530,922, Cl. 514-63.000.
Squire, Edward N., 4,530,569, Cl. 350-96.340.
Vasta, Joseph A., 4,531,010, Cl. 560-125.000.
Wang, Chia-Lin J., 4,530,933, Cl. 514-425.000.

Durkoppwerke GmbH: *See*—
Pollmeier, Konrad; and Moll, Philipp, 4,530,294, Cl. 112-63.000.

Duve, Wolfgang, to Amerace Corporation. Multi-edge spring insert for twist-on connectors. 4,531,016, Cl. 174-87.000.

Dyson Refractories Limited: *See*—
Sambrook, Rodney M.; and Ross, Julian R. H., 4,530,918, Cl. 502-303.000.

E-Systems, Inc.: *See*—
Thurber, Charles H., Jr.; Behrens, Frederick A.; and Hunton, John H., 4,530,476, Cl. 244-3.210.

Eagar, Thomas W.: *See*—
Shoup, Thomas E.; Maykut, Dennis J.; and Eagar, Thomas W., 4,531,042, Cl. 219-99.000.

Eastern Bowling Equipment Company: *See*—
Paster, Ernest E.; and Paster, David, 4,530,501, Cl. 273-43.00R.

Eastman Kodak Company: *See*—
Weaver, Max A.; and Giles, Ralph R., 4,530,997, Cl. 534-768.000.

Eaton Corporation: *See*—
Schutten, Herman P., 4,530,317, Cl. 123-46.00R.

Ebeling, Peter: *See*—
Kluting, Bernd; Ebeling, Peter; and Strowik, Willibald, 4,530,481, Cl. 248-394.000.

Eberhart, Robert C.: *See*—
Munro, Mark S.; Quattrone, Alfred J.; Ellsworth, Steven R.; and Eberhart, Robert C., 4,530,974, Cl. 525-329.400.

Eby, Devon L.: *See*—
Sheets, Keith A.; and Eby, Devon L., 4,530,308, Cl. 119-52.00B.

Economy Forms Corporation: *See*—
Phillips, Jim D., 4,530,648, Cl. 425-65.000.

Edberg, Peter K.: *See*—
Crane, Hewitt D.; Ostrem, John S.; and Edberg, Peter K., 4,531,231, Cl. 382-13.000.

EerNisse, Errol P., to Ohaus Scale Corporation. Piezoelectric crystal resonator with reduced impedance and sensitivity to change in humidity. 4,531,073, Cl. 310-370.000.

Egyt Gyogyszervegyeszeti Gyar: *See*—
Rakoczi, Jozsef; Berenyi nee Poldermann, Edit; Fekete, Bela; Szekeres, Laszlo ; Papp, Gyula; and Keszthelyi nee Udvary, Eva, 4,530,923, Cl. 514-183.000.

Ehn, Dennis C., to Itek Corporation. Display processor system and method. 4,531,160, Cl. 358-240.000.

Eichlseder, Martin; and Burkle, Erwin, to Krauss-Maffei Aktiengesellschaft. Check valve arrangement for the discharge end of an extruder, plastifier or the like. 4,530,605, Cl. 366-79.000.

Eisenring, Hugo: *See*—
Schluep, Rene ; and Eisenring, Hugo, 4,530,390, Cl. 160-178.00R.

Eklund, Vidar: *See*—
Selin, Johan-Fredrik; Huttunen, Jouko; Turunen, Olli; Fors, Jan; Eklund, Vidar; and Ekman, Kurt, 4,530,999, Cl. 536-30.000.

Ekman, Kurt: *See*—
Selin, Johan-Fredrik; Huttunen, Jouko; Turunen, Olli; Fors, Jan; Eklund, Vidar; and Ekman, Kurt, 4,530,999, Cl. 536-30.000.

Ekono Oy: *See*—
Ostman, Per H., 4,530,737, Cl. 159-47.100.

Electric Terminal Corporation: *See*—
Reynolds, Frederick E., Jr., 4,530,562, Cl. 339-191.00R.

Electrovert Ltd.: *See*—
Down, William H., 4,530,457, Cl. 228-180.200.

Eli Lilly and Company: *See*—
Hershberger, Charles L.; and Rosteck, Paul R., Jr., 4,530,904, Cl. 435-172.300.

Ellsworth, Carroll V.; Schultz, Fredrick W.; and Vastag, Harold J., to Gold Bond Ice Cream, Inc. Manufacture of molded frozen confections. 4,530,214, Cl. 62-71.000.

Ellsworth, Steven R.: *See*—
Munro, Mark S.; Quattrone, Alfred J.; Ellsworth, Steven R.; and Eberhart, Robert C., 4,530,974, Cl. 525-329.400.

ELTECH Systems Corporation: *See*—
Miller, Thomas M.; and Schraff, Raymond J., 4,530,441, Cl. 220-215.000.

Emhart Industries, Inc.: *See*—
Black, Donald; and Pirtle, James D., 4,531,115, Cl. 340-539.000.
Nebelung, Hermann H.; and Futterknecht, Fritz, 4,530,711, Cl. 65-260.000.
Stout, Garry A.; and Ray, Donald L., 4,531,028, Cl. 200-38.00R.
Weaver, Robert F.; and Proctor, Ted G., 4,531,072, Cl. 310-162.000.

Encee Chemical Sales, Inc.: *See*—
Whitehurst, Brooks M.; Clemens, Donald F.; King, Taylor; and Whitehurst, Garnett B., 4,530,735, Cl. 156-642.000.

Ender, Dale R. Attachment device for an auxiliary fishing line. 4,530,181, Cl. 43-44.880.

Endo, Ichiro; Ogura, Shigetaro; and Ohno, Shigeru, to Canon Kabushiki Kaisha. Liquid jet recording method and apparatus. 4,531,138, Cl. 346-140.00R.

Endo, Takeshi: *See*—
Azuma, Kazufumi; Nate, Kazuo; Nakatani, Mitsuo; Yokono, Hitoshi; and Endo, Takeshi, 4,530,746, Cl. 204-159.130.

Energy Conversion Devices, Inc.: *See*—
Hanak, Joseph J.; Nath, Prem; Izu, Masatsugu; and Young, James, 4,530,739, Cl. 204-4.000.

Energy Research Corporation: *See*—
Maru, Hansraj C.; and Farooque, Mohammad, 4,530,887, Cl. 429-16.000.

Engelbrecht, Orest; and Laganza, Joseph L., to Perkin-Elmer Corporation, The. Wafer transferring chuck assembly. 4,530,635, Cl. 414-627.000.
Engemann, Detlef; Fischer, Dieter; and Kleeberg, Heinz, to Triumph-Adler Aktiengesellschaft fur Buro- und Informationstechnik. Document scanning apparatus. 4,531,062, Cl. 250-578.000.
Enichimica Secondaria S.p.A: *See*—
Radici, Pierino, 4,530,980, Cl. 526-73.000.
Enjo, Naonori; Noguchi, Masahiro; and Ide, Satoshi, to Daikin Kogyo Co., Ltd. Working fluids for Rankine cycle. 4,530,773, Cl. 252-67.000.
Enomec S.R.L.: *See*—
Cucchetto, Federico, 4,530,433, Cl. 198-695.000.
Ensotech, Inc.: *See*—
Sabherwal, Inderjit H., 4,530,765, Cl. 210-663.000.
Erdelyi, Miklos: *See*—
Czegledi, Bela; Csovari, Mihaly; Erdelyi, Miklos; Illi, Jozsef; Stocker, Lajos; Szoke, Attila; Szabo nee Mogyorosi, Katalin; Riederauer, Szilard; Urmossy, Miklos; Terenyi, Gyula; and Csurgai, Istvan, 4,530,819, Cl. 423-112.000.
Erickson, Arnold R.; Panzera, Carlino; and Tolokan, Robert P., to Brunswick Corporation. Ceramic-metal laminate. 4,530,884, Cl. 428-608.000.
Erickson, Vernon G. Self-propelled, foldable grain conveyor. 4,530,429, Cl. 198-313.000.
Ernst, Alfons, to Johannes Heidenhain GmbH. Multicoordinate sensing head. 4,530,159, Cl. 33-169.00R.
Ernst, Alfons: *See*—
Burkhardt, Horst; Ernst, Alfons; and Dangschat, Holmer, 4,530,155, Cl. 33-1.00L.
Eschem Inc.: *See*—
Werber, Gerhardt P., 4,530,988, Cl. 526-270.000.
Eshima, Kiyoshi: *See*—
Matsushita, Yoh-ichi; Hasegawa, Etsuo; Eshima, Kiyoshi; and Tsuchida, Eishun, 4,530,794, Cl. 260-245.910.
Esneault, Calvin P.; Fuentes, Ricardo, Jr.; and Meiske, Larry A., to Dow Chemical Company, The. Catalyst prepared from organomagnesium compound, carbon dioxide compound, reducing halide source and transition metal compound. 4,530,915, Cl. 502-115.000.
Etablissments J. M. Chauquet: *See*—
Chauquet, Jacques, 4,530,158, Cl. 33-169.00B.
Etani, Kenji. Methods and apparatus for bathing. 4,530,120, Cl. 4-538.000.
Ethyl Molded Products Company: *See*—
Rounkles, Rodney G.; and Holder, Billy W., 4,530,466, Cl. 239-327.000.
Etoh, Yukihiro: *See*—
Tanaka, Toshiaki; Miyazaki, Hiroaki; Etoh, Yukihiro; Kanesaki, Nobukazu; and Iijima, Akihiro, 4,530,324, Cl. 123-300.000.
Etzrodt, Gunter: *See*—
Ostertag, Werner; Dimroth, Peter; Wienand, Henning; Liedek, Egon; Knittel, Helmut; and Etzrodt, Gunter, 4,530,725, Cl. 106-298.000.
Eurecat - Societe Europeenne de Retraitement de Catalyseurs: *See*—
Georges, Berrebi, 4,530,917, Cl. 502-220.000.
European Atomic Energy Community (Euratom): *See*—
Crutzen, Serge; Franzetti, Gian Aldo; and Battagin, Gian Piero, 4,530,241, Cl. 73-602.000.
Evana Tool & Engineering Inc.: *See*—
Fuchs, Gilbert; Crowley, Norman; and Wink, Randall, 4,530,729, Cl. 156-217.000.
Evans, Kenneth R.: *See*—
Beaver, Richard N.; Evans, Kenneth R.; and Waters, Donald D., 4,530,749, Cl. 204-296.000.
Evans, Ronald M.; Swanson, Larry; Vale, Wylie W., Jr.; Rosenfeld, Michael G.; Amara, Susan G.; Brown, Marvin R.; and Rivier, Jean E. F., to Salk Institute for Biological Studies, The. Synthetic calcitonin-gene-related peptides for lowering blood pressure or gastric acid secretion in mammals. 4,530,838, Cl. 514-11.000.
Evans, Steven J.; and Symons, Robert S., to Varian Associates, Inc. Multidiameter cavity for reduced mode competition in gyrotron oscillator. 4,531,103, Cl. 331-83.000.
Everson, William G.; and Stevens, Richard D. Rotary packaging technology. 4,530,686, Cl. 493-315.000.
Evlanov, Viktor I., to Avtomobilny Zavod Imeni Leninskogo Komsomola. Suspension of a motor vehicle. 4,530,512, Cl. 280-661.000.
Ewen, John A.; and Welborn, Howard C., Jr., to Exxon Research & Engineering Co. Process and catalyst for producing polyethylene having a broad molecular weight distribution. 4,530,914, Cl. 502-113.000.
Exxon Research and Engineering Co.: *See*—
Borcenk, Frank; Forsythe, Jeffry A.; and Roe, Frank L., 4,530,611, Cl. 400-175.000.
Ewen, John A.; and Welborn, Howard C., Jr., 4,530,914, Cl. 502-113.000.
Lundberg, Robert D.; Lenz, Robert W.; and Oster, Bernd, 4,530,987, Cl. 526-240.000.
Ritchie, Joseph M.; Chang, Bong H.; and Sosnowski, John, 4,530,755, Cl. 208-96.000.
Weiss, Robert A.; Lundberg, Robert D.; and Werner, Allen C., 4,530,986, Cl. 526-240.000.
F. S. Carbon Company: *See*—
Carbon, Fred S., 4,531,048, Cl. 219-525.000.
Fa. Oskar Schleicher: *See*—
Schleicher, Oskar H., 4,530,382, Cl. 139-455.000.
Seiler, Wolfgang, 4,530,380, Cl. 139-59.000.
Faitel, William M.: *See*—
Mason, Arthur C.; Faitel, William M.; and Haselhuhn, James M., 4,530,637, Cl. 414-750.000.
Fancelli, Fabio: *See*—
Alluto, Luigi; and Fancelli, Fabio, 4,530,217, Cl. 62-156.000.
Farina, Carlo: *See*—
Clavenna, Gaetano; Farina, Carlo; Pinza, Mario; and Pifferi, Giorgio, 4,530,934, Cl. 514-548.000.
Farmacon Research Corporation: *See*—
Niazi, Sarfaraz, 4,530,936, Cl. 514-749.000.
Farnstrom, Kenneth A.: *See*—
Walker, Kenneth L.; and Farnstrom, Kenneth A., 4,530,522, Cl. 285-91.000.
Farooque, Mohammad: *See*—
Maru, Hansraj C.; and Farooque, Mohammad, 4,530,887, Cl. 429-16.000.
Fasern Aktiengesellschaft: *See*—
Ostertag, Werner; Dimroth, Peter; Wienand, Henning; Liedek, Egon; Knittel, Helmut; and Etzrodt, Gunter, 4,530,725, Cl. 106-298.000.
Fatzer AG: *See*—
Seiler, Ernst; and Lang, Wilhelm, 4,530,205, Cl. 57-9.000.
Faugeras, Philippe, to Cii Honeywell Bull (Societe Anonyme). Optoelectronic method of reading data on a magnetic medium and circuit for performing said method. 4,531,205, Cl. 369-13.000.
Favard, Jean-Claude: *See*—
Poupon, Andre; and Favard, Jean-Claude, 4,531,188, Cl. 364-422.000.
FDX Patents Holding Company, N.V.: *See*—
Perkins, Roger G.; and Trujillo, Stephen M., 4,530,812, Cl. 376-142.000.
Feichtinger, Gerhard, to A V L Gesellschaft Fur Verbrennungskraftmaschinen Und Messtechnik M.B.H. Water-cooled two-cylinder two-stroke internal combustion engine. 4,530,314, Cl. 123-41.740.
Feichtinger, Kurt, to Johannes Heidenhain GmbH. Sensing pin mounting arrangement for multicoordinate sensing head. 4,530,160, Cl. 33-559.000.
Fekete, Bela: *See*—
Rakoczi, Jozsef; Berenyi nee Poldermann, Edit; Fekete, Bela; Szekeres, Laszlo ; Papp, Gyula; and Keszthelyi nee Udvary, Eva, 4,530,923, Cl. 514-183.000.
Felstehausen, Eugene F., to Illinois Tool Works Inc. Carrier cutting wheel. 4,530,264, Cl. 83-175.000.
Fenn, John B.: *See*—
Labowsky, Michael J.; Fenn, John B.; and Yamashita, Masamichi, 4,531,056, Cl. 250-288.000.
Ferrari, Attilio: *See*—
Raspanti, Guiseppe; Fossati, Norberto; and Ferrari, Attilio, 4,530,950, Cl. 524-100.000.
Ferraro, Thomas A. Jaw locking means for lathe chucks. 4,530,508, Cl. 279-123.000.
Ferrero, Daniele, to RIV-SKF Officine di Villar Perosa, SpA. Self adjusting hydraulic tappet for heat engines. 4,530,320, Cl. 123-90.560.
Fetters, Wayne A.; and Chittick, Donald E., to Pyrenco, Inc. Method for producing fuel gas from organic material, capable of self-sustaining operation. 4,530,702, Cl. 48-209.000.
Fine Particle Technology Corporation: *See*—
Wiech, Raymond E., Jr., 4,531,145, Cl. 357-81.000.
Fink, Roland; Bartos, Hubert; Noschilla, Herbert; and Klingenstein, Walter, to Oskar Frech GmbH & Co. Apparatus for the production of die-cast parts with adjustable piston travel length and initial and final positions. 4,530,391, Cl. 164-155.000.
Finnell, Reuben. Thermos bottle cap doubles as a cup. 4,530,439, Cl. 220-90.400.
Firestone Tire & Rubber Company, The: *See*—
Gutierrez, Richard; Kay, Edward L.; and Serbin, David J., 4,530,995, Cl. 528-930.000.
Hall, James E., 4,530,984, Cl. 526-177.000.
Firey, Joseph C. Cyclic gas separator. 4,530,705, Cl. 55-162.000.
Fischer, Dieter: *See*—
Engemann, Detlef; Fischer, Dieter; and Kleeberg, Heinz, 4,531,062, Cl. 250-578.000.
Fischer, Hermann, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Rotary printing machine with liquid supply apparatus comprising an endless band. 4,530,284, Cl. 101-350.000.
Fischer, Hermann, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Printing machine inking monitoring system. 4,530,285, Cl. 101-365.000.
Fish, William M.: *See*—
Schlesinger, Allen H.; Hudson, L. Keith; and Fish, William M., 4,530,699, Cl. 23-301.000.
Fisher, Almon P.: *See*—
Drews, Reinhold E.; Fisher, Almon P.; Hermanson, Herman A.; and Pond, Stephen F., 4,531,137, Cl. 346-74.400.
Flabbi, Luciano: *See*—
Moggi, Giovanni; Flabbi, Luciano; and Strepparola, Ezio, 4,530,969, Cl. 525-180.000.
Flamme, Walter; and Rahn, Oskar, to L. Schuler GmbH. Tool changing mechanism. 4,530,148, Cl. 29-568.000.
Flandrois, Serge: *See*—
Baron, Francis; Flandrois, Serge; and Pacault, Adolphe, 4,530,888, Cl. 429-206.000.
Flux-Geraete Gesellschaft Mit Beschraenkter Haftung: *See*—
Gschwender, Alois, 4,530,641, Cl. 415-170.00R.
FMC Corporation: *See*—
Kassai, Denes P., 4,530,416, Cl. 180-307.000.

Foissner, Herbert; Krautwald, Herbert; and Minke, Lutz, to Siemens Aktiengesellschaft. Insulating arrangement for a capacitive protective fence having a metal encapsulated insulator, a mounting device for an electric wire and a device for fastening the insulating arrangement to a fence post. 4,531,019, Cl. 174-163.00F.

Folser, Karl: *See—*
Theurer, Josef; Folser, Karl; and Oellerer, Friedrich, 4,530,403, Cl. 171-16.000.

Ford Motor Company: *See—*
Chang, Dale U., 4,531,044, Cl. 219-121.0LM.
Kordomenos, Panagiotis I.; Kurple, Kenneth R.; and Alexander, Delores J., 4,530,976, Cl. 525-440.000.
Theodore, Ares N.; and Chattha, Mohinder S., 4,530,957, Cl. 524-504.000.

Formica Corporation: *See—*
Knapp, Larry J.; and Drees, Terry P., 4,530,883, Cl. 428-503.000.

Forrest, Robert S.; Brouwer, Floyd; and Applegate, Merlin J., to Forrest, Robert S. Apparatus and method for boresighting a firearm. 4,530,162, Cl. 33-228.000.

Fors, Jan: *See—*
Selin, Johan-Fredrik; Huttunen, Jouko; Turunen, Olli; Fors, Jan; Eklund, Vidar; and Ekman, Kurt, 4,530,999, Cl. 536-30.000.

Forssmann, Bernd; Wess, Othmar; Zech, Hendrik; and Chaussy, Christian, to Dornier System GmbH. Apparatus for comminuting concretions in bodies of living beings. 4,530,358, Cl. 128-328.000.

Forsythe, Jeffry A.: *See—*
Borcenk, Frank; Forsythe, Jeffry A.; and Roe, Frank L., 4,530,611, Cl. 400-175.000.

Fossati, Norberto: *See—*
Raspanti, Guiseppe; Fossati, Norberto; and Ferrari, Attilio, 4,530,950, Cl. 524-100.000.

Foster, Basil B., to International Standard Electric Corporation. Clock extraction circuit for a PCM signal. 4,531,222, Cl. 375-106.000.

Fowler, Allan E.: *See—*
Jones, Mark B.; and Fowler, Allan E., 4,530,704, Cl. 55-48.000.

Frangatos, Gerassimos, executor: *See—*
Braić, Milton, deceased, 4,530,770, Cl. 252-49.600.

Franz, Helmut: *See—*
Duffer, Paul F.; Franz, Helmut; and Kelly, Joseph D., 4,530,889, Cl. 428-326.000.

Franz Plasser Baumaschinen Industriegesellschaft M.B.H: *See—*
Theurer, Josef; Folser, Karl; and Oellerer, Friedrich, 4,530,403, Cl. 171-16.000.

Franzetti, Gian Aldo: *See—*
Crutzen, Serge; Franzetti, Gian Aldo; and Battagin, Gian Piero, 4,530,241, Cl. 73-602.000.

Frass, Werner: *See—*
Berghaeuser, Gunter; Schell, Loni; and Frass, Werner, 4,530,897, Cl. 430-302.000.

Fredriksson, Lars O. A., to K A Bergs Smide AB. Connection means, particularly for a suspended load. 4,530,534, Cl. 294-82.110.

Freedman, Harold H., to Dow Chemical Company, The. Crosslinked gelatin foams. 4,530,905, Cl. 435-177.000.

Freeman, Sandra D. Display box assembly. 4,530,685, Cl. 493-151.000.

Freeman, Willie B.; and Span, Richard M., to Westinghouse Electric Corp. Pneumatic operating mechanism for a circuit breaker. 4,531,031, Cl. 200-82.00B.

French, James C.: *See—*
Bunge, Richard H.; French, James C.; Hurley, Timothy R.; Smitka, Tim A.; and Tunac, Josefino B., 4,530,835, Cl. 424-117.000.

Fresenius Aktiengesellschaft: *See—*
Schal, Wilfried, 4,530,759, Cl. 210-104.000.

Frey, Otto, to Sulzer Brothers Limited. Anchoring shank for a bone implant. 4,530,116, Cl. 623-23.000.

Frey, Otto: *See—*
Muller, Maurice E.; Niederer, Peter G.; and Frey, Otto, 4,530,115, Cl. 623-23.000.

Fricker, Urs: *See—*
Martin, Henry; and Fricker, Urs, 4,530,716, Cl. 71-88.000.

FROCEMCO, Inc.: *See—*
Jasperse, Philip D.; Weis, Siegfried K.; and Sovis, Milo D., Jr., 4,530,609, Cl. 384-482.000.

Frohberger, Paul-Ernst: *See—*
Kranz, Eckart; Buchel, Karl H.; Kraatz, Udo; Regel, Erik; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Lurssen, Klaus, 4,530,715, Cl. 71-76.000.

Froilan, Faustino C. Endotrachael tube and holder. 4,530,354, Cl. 128-207.170.

Fromageot, Pierre: *See—*
Charon, Marie-Helene; Fromageot, Pierre; and Van Chuong, Paul P., 4,530,837, Cl. 514-18.000.

Fuchs, Gilbert; Crowley, Norman; and Wink, Randall, to Evana Tool & Engineering Inc. Folding of flat sheet to exact interior height. 4,530,729, Cl. 156-217.000.

Fuentes, Ricardo, Jr.: *See—*
Esneault, Calvin P.; Fuentes, Ricardo, Jr.; and Meiske, Larry A., 4,530,915, Cl. 502-115.000.

Fuji Electric Company, Ltd.: *See—*
Yasuhara, Takeshi; and Nabeta, Eiichi, 4,531,193, Cl. 364-551.000.

Fuji Photo Film Co., Ltd.: *See—*
Hara, Hiroshi; Tobioka, Takashi; Yoshino, Takeshi; Nishikawa, Tetuo; and Sekine, Jiro, 4,530,582, Cl. 354-203.000.
Kanai, Masaharu, 4,530,585, Cl. 354-416.000.
Kawai, Yasuhiro, 4,530,590, Cl. 355-8.000.
Murakoshi, Makoto, 4,531,161, Cl. 360-10.100.
Ohki, Nobutaka; Furutachi, Nobuo; and Yoshida, Yoshinobu, 4,530,899, Cl. 430-551.000.

Fuji Xerox Co., Ltd.: *See—*
Leng, Svay, 4,531,133, Cl. 346-76.0PH.

Fujikata, Kenji: *See—*
Nakayama, Takeshi; Kurosu, Masaaki; Ohshima, Yoshimitsu; Fujikata, Kenji; Uchida, Shigeru; and Nakajima, Akira, 4,531,119, Cl. 340-712.000.

Fujikawa, Hisao: *See—*
Moroishi, Taishi; Fujikawa, Hisao; Murayama, Junichiro; and Shoji, Yuji, 4,530,720, Cl. 75-128.00A.

Fujikawa, Katsuhiro, to Mitsubishi Denki Kabushiki Kaisha. Speed control apparatus for sewing machine. 4,530,297, Cl. 112-275.000.

Fujikawa, Yoshiyuki: *See—*
Morino, Masuaki; Fujikawa, Yoshiyuki; Haneda, Isamu; and Myoi, Tetsuo, 4,531,194, Cl. 364-705.000.

Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, to Sumitomo Chemical Co., Ltd. Optically active phenyl acetates. 4,531,008, Cl. 549-447.000.

Fujisawa Pharmaceutical Co., Ltd.: *See—*
Ikushima, Koichi; Tanaka, Hirokazu; Osamu, Ohe; Kino, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Arakawa, Akira; and Imanaka, Hiroshi, 4,530,845, Cl. 514-453.000.

Fujitju Limited: *See—*
Ohtsuki, Osamu, 4,531,225, Cl. 377-58.000.

Fujitsu Fanuc Limited: *See—*
Inaba, Hajimu; Sakakibara, Shinsuke; and Nihei, Ryo, 4,530,636, Cl. 414-730.000.

Fujitsu Limited: *See—*
Shirato, Takehide, 4,530,150, Cl. 29-576.00B.

Fujiwara, Katsuyoshi: *See—*
Saitoh, Kiyonobu; and Fujiwara, Katsuyoshi, 4,530,494, Cl. 271-9.000.

Fujiya, Toshimichi. Unlatching device for latch of refrigeration chamber or the like. 4,530,532, Cl. 292-341.150.

Fukaya, Chikara: *See—*
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,530,926, Cl. 514-214.000.

Fukino, Masato; Yanai, Tokiyoshi; Yamaguchi, Hirotsugu; and Aoyama, Yutaka, to Nissan Motor Company, Limited. Steering assistance pressure control apparatus. 4,530,414, Cl. 180-142.000.

Fukuhara, Yoshio; and Koizumi, Hideo, to Tokyo Shibaura Denki Kabushiki Kaisha. Rotary anode for X-ray tube. 4,531,227, Cl. 378-144.000.

Fukunaga, Osamu: *See—*
Shindo, Mizuo; Yamamoto, Takashi; Fukunaga, Osamu; and Yamamori, Hisayoshi, 4,530,809, Cl. 264-210.700.

Fukuzawa, Genichiro; and Idesawa, Isao, to Nisshin Kogyo Kabushiki Kaisha. Automatic braking-gap adjuster system for hydraulic brake. 4,530,424, Cl. 188-196.00D.

Funk, Gary L. Constraint control of a fractional distillation process. 4,530,738, Cl. 203-2.000.

Furukawa, Yasuyoshi: *See—*
Tatemoto, Masayoshi; Furukawa, Yasuyoshi; Tomoda, Masayasu; Oka, Masahiko; and Morita, Shigeru, 4,530,972, Cl. 525-276.000.

Furusawa, Takashi: *See—*
Katsuura, Nobuo; and Furusawa, Takashi, 4,530,615, Cl. 403-16.000.

Furuta, Toshio; Kawamoto, Nobuhiko; and Honma, Akira, to Mitsui Kensetsu Kabushiki Kaisha. Shield driving process for enlargement. 4,530,621, Cl. 405-150.000.

Furutachi, Nobuo: *See—*
Ohki, Nobutaka; Furutachi, Nobuo; and Yoshida, Yoshinobu, 4,530,899, Cl. 430-551.000.

Futakawa, Akemi: *See—*
Ito, Toshio; Futakawa, Akemi; and Nakazaki, Osamu, 4,530,477, Cl. 244-153.00R.

Futami, Toru: *See—*
Noso, Kazunori; Kishi, Norimasa; and Futami, Toru, 4,531,228, Cl. 381-46.000.

Futterknecht, Fritz: *See—*
Nebelung, Hermann H.; and Futterknecht, Fritz, 4,530,711, Cl. 65-260.000.

G.I.E. Technistan: *See—*
Guillon, Henri, 4,530,186, Cl. 49-441.000.

Gaber, Ira; and Lawrence, Harry E., III, to J. C. Penney Co., Inc. Infant seat for cantilevered mounting onto a tabletop. 4,530,539, Cl. 297-174.000.

Gallagher, Gail: *See—*
Iyengar, Mike; and Gallagher, Gail, 4,530,344, Cl. 126-246.000.

Ganesan, Apparajan, to AT&T Technologies, Inc. Switched capacitor circuits. 4,531,106, Cl. 333-173.000.

Ganguly, Ashit K.: *See—*
Girijavallabhan, Viyyoor M.; Ganguly, Ashit K.; Pinto, Patrick A.; and Versace, Richard W., 4,530,793, Cl. 260-245.20R.

Gardner, Thomas J.: *See—*
Bork, Carl R., Jr.; Steiss, William C.; Tobbe, William P.; Shufflebarger, Earl D.; Matousek, Stephen; and Gardner, Thomas J., 4,530,373, Cl. 137-516.290.

Gardos, Ivan, to Biomatics Inc. Magnetic lifting device for a cellular sample treatment apparatus. 4,530,304, Cl. 118-66.000.

Garfield, Daniel J. Rhythm controller. 4,530,267, Cl. 84-1.030.

Gartner, Georg; and Gotje, Egbert B. G. W., to U.S. Philips Corporation. Method of making a borided dispenser cathode. 4,530,669, Cl. 445-51.000.

Gauchet, Yves; Crinquette, Andre ; Martinet, Pascal; and Lestradet, Denis, to Nodet Gougis. Method and device for calibrating a regulated flow spraying apparatus. 4,530,465, Cl. 239-127.000.

Gay, Don D.; and McMillan, William G., to United States of America, Energy. Method for sampling sub-micron particles. 4,530,250, Cl. 73-863.120.

Gearhart Industries Incorporated: *See*—
Blankinship, Thomas J., 4,530,161, Cl. 33-178.00E.

Gebruder Selzer AG: *See*—
Muller, Maurice E.; Niederer, Peter G.; and Frey, Otto, 4,530,115, Cl. 623-23.000.

Geen, Joseph H.: *See*—
Corley, John E.; Andert, Charles M.; Geen, Joseph H.; Wells, Wesley G.; and Lark, Russell D., 4,530,625, Cl. 408-14.000.

General Electric Company: *See*—
Borman, Willem F. H.; and Semen, John, 4,530,878, Cl. 428-334.000.
Brisken, Axel F., 4,530,363, Cl. 128-663.000.
Herz, Harold L.; Jobes, Sam S.; Jordan, John D.; Benfey, David P.; and Wheeler, William C., 4,531,181, Cl. 363-21.000.
Rampel, Guy, 4,530,890, Cl. 429-217.000.
Renlund, Gary M.; and Johnson, Curtis A., 4,530,808, Cl. 264-63.000.
Sippel, David F.; and Kearns, Robert L., 4,530,861, Cl. 427-444.000.

General Foods Corporation: *See*—
Bannon, Glen M.; Hardie-Muncy, Darlene A.; and Wauters, Ronald P., 4,530,848, Cl. 426-293.000.

General Motors Corporation: *See*—
Sigety, Stephen, Jr., 4,530,412, Cl. 180-69.210.

General Signal Corporation: *See*—
Bogenschutz, Thomas M., 4,530,422, Cl. 188-52.000.

Genna, Salvatore A., to Russo, Neil C., a part interest. Display system. 4,530,549, Cl. 312-121.000.

Georges, Berrebi, to Eurecat - Societe Europeenne de Retraitement de Catalyseurs. Process of presulfurizing catalysts for hydrocarbons treatment. 4,530,917, Cl. 502-220.000.

Gerhardt, Winfried: *See*—
Weiler, Rolf; Kretzer, Horst; Leidecker, Hans-Dieter; and Gerhardt, Winfried, 4,530,506, Cl. 277-212.0FB.

Geri, Sergio; Moggi, Giovanni; and Lagana, Carlo, to Montedison S.p.A. Covulcanizable compositions from fluoroelastomers based on vinylidene fluoride and copolymers tetrafluoroethylene-propylene. 4,530,971, Cl. 525-199.000.

Gerin, Merlin: *See*—
Mertz, Jean-Luc, 4,531,172, Cl. 361-13.000.

Gialanella, Joseph: *See*—
Canfield, Douglas M.; and Gialanella, Joseph, 4,531,047, Cl. 219-354.000.

Gibson, Dennis H.; and Stockner, Alan R., to Caterpillar Tractor Co. Thrust and planetary gear coupling for a rotor of a distributor fuel injection pump. 4,530,331, Cl. 123-450.000.

Gibson, Duane M.; and Scott, Lewis A., to Omark Industries, Inc. Saw chain sharpening method and apparatus. 4,530,258, Cl. 76-25.00A.

Giles, Ralph R.: *See*—
Weaver, Max A.; and Giles, Ralph R., 4,530,997, Cl. 534-768.000.

Gimpel, Juergen; Schwendemann, Volker; and Gulbins, Erich, to Basf Aktiengesellschaft. Surface coating binder containing blocked isocyanate groups. 4,530,978, Cl. 525-528.000.

Gingerich, David J.; Rose, William H.; Rupnik, David W.; and Shaffer, David T., to AMP Incorporated. Electrical switch and actuating mechanism therefor. 4,531,030, Cl. 200-68.200.

Ginster, Helmut, to Draftex Development AG. Glazing supports. 4,530,192, Cl. 52-397.000.

Gipp, Mark M., to S. C. Johnson & Son, Inc. Metastable prespotting composition. 4,530,781, Cl. 252-546.000.

Girijavallabhan, Viyyoor M.; Ganguly, Ashit K.; Pinto, Patrick A.; and Versace, Richard W., to Schering Corporation. Processes for the production of penems. 4,530,793, Cl. 260-245.20R.

GK Technologies, Incorporated: *See*—
Whitlock, Jonathan B.; and Drzala, Christopher W., 4,531,102, Cl. 331-1.00A.

Glass Equipment Development, Inc.: *See*—
Leopold, Edmund A., 4,530,195, Cl. 52-726.000.

Glaxo Group Limited: *See*—
Collington, Eric W.; Hallett, Peter; Wallis, Christopher J.; and Bradshaw, John, 4,530,925, Cl. 514-211.000.

Gleason, Everett: *See*—
Granzow, Carl F.; Lash, Edward G.; Gleason, Everett; and Kubiak, Jerome, 4,530,226, Cl. 72-171.000.

Gloor, Peter; Gschwend, Hans; Mark, Fritz; and Matt, Lukas, to Hilti Aktiengesellschaft. Device for driving nails and similar fastening elements. 4,530,454, Cl. 227-129.000.

Godbout, Normand, to Universite de Sherbrooke. Solid fuel furnace. 4,530,289, Cl. 110-117.000.

Goebel, Ulrich: *See*—
Schmidt, Lothar; and Goebel, Ulrich, 4,531,111, Cl. 338-195.000.

Goetz, Michael A.: *See*—
Monaghan, Richard L.; Goetz, Michael A.; and Chang, Raymond S. L., 4,530,790, Cl. 260-239.30P.

Gold Bond Ice Cream, Inc.: *See*—
Ellsworth, Carroll V.; Schultz, Fredrick W.; and Vastag, Harold J., 4,530,214, Cl. 62-71.000.

Goldacker, Erhard: *See*—
Hubner, Wolfgang; Klein, Helmut; Goldacker, Erhard; and Schroers, Otto, 4,530,943, Cl. 523-318.000.

Goldstein, Seth R.; and Jones, Robert, to United States of America, Health and Human Services. Method and apparatus for traversing blood vessels. 4,530,698, Cl. 604-271.000.

Goodman, Jack P. Self-anchoring fence post and method of installing same. 4,530,190, Cl. 52-165.000.

Goodnow, Robert A.; Shade, Floyd J.; and Sloboth, Thomas A., to Schering Corporation. Method of vaccination for prevention of *Bordetella bronchiseptica* infection. 4,530,832, Cl. 424-92.000.

Goodyear Tire & Rubber Company, The: *See*—
Armbruster, Robert G.; and Scriver, Richard M., 4,530,959, Cl. 524-526.000.

Gordon, Eliot. Device for protecting the web of a hand in a medical cast. 4,530,351, Cl. 128-82.000.

Gordon, Robert E.: *See*—
Ordidge, Roger J.; and Gordon, Robert E., 4,531,094, Cl. 324-309.000.

Gorges, Friedrich J., to Boeing Company, The. Unitary access panel for aircraft fuel tanks. 4,530,443, Cl. 220-327.000.

Gorman, Edith C. Self-adhering members. 4,530,867, Cl. 428-41.000.

Gossen, Hans: *See*—
Von Schwerdtner, Otto; Gossen, Hans; Gunther, Jurgen; and Peters, Hans, 4,530,212, Cl. 60-657.000.

Gotje, Egbert B. G. W.: *See*—
Gartner, Georg; and Gotje, Egbert B. G. W., 4,530,669, Cl. 445-51.000.

Gotz, Laszlo; and Kowatsch, Hermann, to Texas Instruments Deutschland GmbH. High frequency amplifier. 4,531,097, Cl. 330-254.000.

Gowdy, Hugh W.: *See*—
Deering, Roland F.; Gowdy, Hugh W.; and Kelley, Arnold E., 4,530,752, Cl. 208-11.00R.

Grammel, Jurgen: *See*—
Halpaap, Reinhard; Pedain, Josef; Thoma, Wilhelm; and Grammel, Jurgen, 4,530,990, Cl. 528-53.000.

Granhaug, Otto J.: *See*—
Yonker, John H.; Williams, Charles R.; and Granhaug, Otto J., 4,530,485, Cl. 251-93.000.

Granzow, Carl F.; Lash, Edward G.; Gleason, Everett; and Kubiak, Jerome, to Tishken Products, Inc. Sweep-forming apparatus. 4,530,226, Cl. 72-171.000.

Graphic Enterprises of Ohio, Inc.: *See*—
Hovekamp, John C., 4,530,306, Cl. 118-669.000.

Graves, Louis N., to Louis N. Graves Company, Inc. Sharpening apparatus. 4,530,188, Cl. 51-214.000.

Gray, Thomas W.; and Whitney, Ralph H., to Owens-Illinois, Inc. Tamperproof package. 4,530,437, Cl. 215-252.000.

Great Lakes Carbon Corporation: *See*—
Lewallen, Steve F.; Lewis, Billy J.; McIver, James R.; Hoss, Robert E.; and Pierce, Edward W., 4,530,853, Cl. 427-113.000.

Greaves, Roy A.: *See*—
Ashley, Michael J.; Greaves, Roy A.; and Wyatt, John G., 4,530,822, Cl. 423-242.000.

Green Cross Corporation, The: *See*—
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,530,926, Cl. 514-214.000.

Green, David T., to United States Surgical Corporation. Surgical fastener applying apparatus. 4,530,453, Cl. 227-19.000.

Green, Frederick A.; and Seedhouse, Frederick A., to Xerox Corporation. Registration mechanism for a multimagnification reproduction apparatus. 4,530,592, Cl. 355-11.000.

Green, Morris J. Insulated vent adaptor. 4,530,170, Cl. 34-82.000.

Greene, Carl B., Jr.; and Greene, Carl B., III. Forward entrance, rear exit horse trailer. 4,530,538, Cl. 296-24.00C.

Greene, Carl B., III: *See*—
Greene, Carl B., Jr.; and Greene, Carl B., III, 4,530,538, Cl. 296-24.00C.

Greenlee, Donald R.; and Kline, Albert E., to Arrow Oil Tools, Inc. Retrievable well bore packer. 4,530,398, Cl. 166-123.000.

Greenspan, Donald J. Dispenser. 4,530,447, Cl. 221-288.000.

Gregory, Reginald; and Westlake, David J., to British Petroleum Company p.l.c., The. Process for the conversion of a C_2 to C_{10} aliphatic linear olefin to a product comprising hydrocarbons of higher carbon number. 4,531,014, Cl. 585-415.000.

Gresch, Heinrich: *See*—
Holter, Heinz; Igelbuscher, Heinrich; Gresch, Heinrich; and Dewert, Heribert, 4,530,817, Cl. 422-122.000.

Griep, Winfried: *See*—
Bergheim, Hans; and Griep, Winfried, 4,530,145, Cl. 29-458.000.

Griesser AG: *See*—
Schluep, Rene ; and Eisenring, Hugo, 4,530,390, Cl. 160-178.00R.

Griggs, Calvin, to Richards Manufacturing Co., Inc. Compression screw assembly. 4,530,355, Cl. 128-92.0BB.

Grime, David A.: *See*—
Pitman, Kelvin G.; Grime, David A.; and Knight, Malcolm R. M., 4,530,246, Cl. 73-799.000.

Grinwald, Israel M., to United States of America, Army. Motorized wheels for dolly structures. 4,530,411, Cl. 180-11.000.

Grinwis, Jack M.: *See*—
Brown, Ronald E.; and Grinwis, Jack M., 4,530,350, Cl. 128-82.000.

Grossi, Giuseppe: *See*—
Arcuri, Luigi; Bertotti, Elvio; Carignani, Giancarlo; Cipriani, Aldo; Donato, Aldo; and Grossi, Giuseppe, 4,530,783, Cl. 252-628.000.

Grosvenor, Victor L.: *See*—
Wong, Boon; Morel, Don L.; and Grosvenor, Victor L., 4,531,015, Cl. 136-258.000.

Grosz, Friedrich: *See*—
Sarig, Yoav; Regev, Yitzhak; and Grosz, Friedrich, 4,530,278, Cl. 99-547.000.

Gruber, Gerhard; Moser, Peter; Conrad, Ulrich; and Vlach, Jiri, to Daimler-Benz Aktiengesellschaft. Tensioning arrangement with a damping device for a belt drive. 4,530,682, Cl. 474-133.000.

Grumman Aerospace Corporation: *See*—
Denaci, Herbert G., 4,530,270, Cl. 89-1.110.

Grund, Christian: *See*—
Lemelson, Jerome H.; and Grund, Christian, 4,531,152, Cl. 358-141.000.

Grunzinger, Raymond E., Jr., to Minnesota Mining and Manufacturing Company. Method of preparing a polymeric coating composition from a blocked isocyanate-functional polymeric compound and a crosslinking agent which is insoluble in aprotic solvents. 4,530,859, Cl. 427-385.500.

Gruppo Lepetit S.p.A.: *See*—
Winters, Giorgio; and Sala, Alberto, 4,530,927, Cl. 514-215.000.

Gschwend, Hans: *See*—
Gloor, Peter; Gschwend, Hans; Mark, Fritz; and Matt, Lukas, 4,530,454, Cl. 227-129.000.

Gschwender, Alois, to Flux-Geraete Gesellschaft Mit Beschraenkter Haftung. Pump, particularly a submersible or barrel pump. 4,530,641, Cl. 415-170.00R.

GTE Automatic Electric Incorporated: *See*—
Ladewski, Chester T.; Chapman, Harry A.; and Johnston, Jeffrey J., 4,531,215, Cl. 371-67.000.
Perry, Thomas J., 4,531,210, Cl. 370-100.000.
Reimer, William A., 4,530,558, Cl. 339-75.00M.

GTE Communication Systems Corporation: *See*—
Reimer, William A., 4,531,175, Cl. 361-399.000.

GTE Laboratories Incorporated: *See*—
Abraham, Leonard G., 4,531,113, Cl. 340-347.00C.

GTE Products Corporation: *See*—
Dullea, Leonard V.; Loughridge, Frederick A.; and Johnson, Stephen G., 4,530,710, Cl. 65-56.000.

Guidoux, Loic B. Y.: *See*—
Brie, Richard; and Guidoux, Loic B. Y., 4,531,220, Cl. 375-14.000.

Guilford, Nigel G. H.; and Cadotte, Alan P., to Tricil Limited. Treatment of acidic organic and alkaline inorganic wastes. 4,530,292, Cl. 110-346.000.

Guillon, Henri, to G.I.E. Technistan. Weather strip for vehicle windows. 4,530,186, Cl. 49-441.000.

Gulbins, Erich: *See*—
Gimpel, Juergen; Schwendemann, Volker; and Gulbins, Erich, 4,530,978, Cl. 525-528.000.

Gunnell, Thomas J. Apparatus for making rubber covered carbon black pellets. 4,530,305, Cl. 118-418.000.

Gunther, Jurgen: *See*—
Von Schwerdtner, Otto; Gossen, Hans; Gunther, Jurgen; and Peters, Hans, 4,530,212, Cl. 60-657.000.

Gutermann, Alfons; Herzog, Heinz; Mohn, Heinrich; and Schulke, Karl A., to Heraeus Quarzschmelze GmbH. Transparent fused silica bell for purposes relating to semiconductor technology. 4,530,818, Cl. 422-240.000.

Gutierrez, Eddie N.: *See*—
Lamberti, Vincent; and Gutierrez, Eddie N., 4,530,801, Cl. 260-503.000.

Gutierrez, Richard; Kay, Edward L.; and Serbin, David J., to Firestone Tire & Rubber Company, The. Methods for storage of guayule plant material. 4,530,995, Cl. 528-930.000.

Gutmanis, Feliks: *See*—
Nagodawithana, Tilak; and Gutmanis, Feliks, 4,530,846, Cl. 426-62.000.

Gutowski, Richard W. File folder unfolding machine. 4,530,688, Cl. 493-409.000.

Gwaldacz, Leo E., Sr.; and Gwazdacz, Leo E., Jr. Jig lure. 4,530,180, Cl. 43-42.280.

Gwazdacz, Leo E., Jr.: *See*—
Gwaldacz, Leo E., Sr.; and Gwazdacz, Leo E., Jr., 4,530,180, Cl. 43-42.280.

Gyorgyi nee Edelenyi, Judit: *See*—
Machovich, Raymund; Nagy, Miklos; Gyorgyi nee Edelenyi, Judit; Horvath, Istvan; Low, Miklos; Csomor, Katalin; Karpati, Egon; Szporny, Laszlo ; and Kisfaludy, Lajos, 4,530,964, Cl 525-61.000.

Haas, Aarne T., to Northwest Natural Gas Company. Timed gas metering and distribution system. 4,530,247, Cl. 73-861.000.

Haas, Helmut: *See*—
Birnbreier, Hermann; and Haas, Helmut, 4,530,852, Cl. 427-102.000.

Hadley, John F., to Cyclops Corporation. Fire resistant foam insulated building panels. 4,530,877, Cl. 428-305.500.

Haduch, Paul R.; and Rega, Anthony, to American Hospital Supply Corporation. Flexible optical inspection system. 4,530,568, Cl. 350-96.260.

Hadziomerovic, Faruk, to Northern Telecom Limited. Multiplexer for bit oriented protocol data link control. 4,531,211, Cl. 370-102.000.

Hadziomerovic, Faruk, to Northern Telecom Limited. Demultiplexer for bit oriented protocol data link control. 4,531,212, Cl. 370-102.000.

Hagelthorn, George A. Method for adjusting and retaining bearings on an axle. 4,530,144, Cl. 29-407.000.

Hagiwara, Akito: *See*—
Matsuura, Mitsuyuki; Kageyama, Yoshiteru; Hagiwara, Akito; and Shimada, Takeo, 4,530,983, Cl. 526-125.000.

Hakamada, Haruo: *See*—
Kaizuma, Hisayuki; and Hakamada, Haruo, 4,530,599, Cl. 355-75.000.

Hake, Kenneth A.; and Hamilton, Gregory A., to Kent Manufacturing Co., Inc. Spring clamp shank assembly. 4,530,406, Cl. 172-705.000.

Hall, James E., to Firestone Tire & Rubber Company, The. Process for production of polymers having increased 1,2-microstructure. 4,530,984, Cl. 526-177.000.

Hallett, Peter: *See*—
Collington, Eric W.; Hallett, Peter; Wallis, Christopher J.; and Bradshaw, John, 4,530,925, Cl. 514-211.000.

Halliburton Company: *See*—
Mosier, John E.; Surjaatmadja, Jim B.; McLawhon, George B.; and Penn, Jack C., 4,531,189, Cl. 364-550.000.

Hallock, Gary W., to AT&T Bell Laboratories. Interface for a video display processor arranged to provide an overlay on a video display. 4,531,154, Cl. 358-148.000.

Halpaap, Reinhard; Pedain, Josef; Thoma, Wilhelm; and Grammel, Jurgen, to Bayer Aktiengesellschaft. Process for the preparation of viscosity stable polyurethane solutions. 4,530,990, Cl. 528-53.000.

Halpern, Joseph Y.; Simons, Barbara B.; and Strong, Hovey R., to International Business Machines Corporation. Centralized synchronization of clocks. 4,531,185, Cl. 364-200.000.

Hamed, Parviz, to SW Industries, Inc. Monomer-plasticized elastomers and process for producing same. 4,530,944, Cl. 523-335.000.

Hamilton Farm: *See*—
Douglas-Hamilton, Diarmaid H., 4,530,816, Cl. 422-1.000.

Hamilton, Gregory A.: *See*—
Hake, Kenneth A.; and Hamilton, Gregory A., 4,530,406, Cl. 172-705.000.

Hamilton, James. Combination back pack/beach chair. 4,530,451, Cl. 224-155.000.

Hanak, Joseph J.; Nath, Prem; Izu, Masatsugu; and Young, James, to Energy Conversion Devices, Inc. Method of fabricating an electroplated substrate. 4,530,739, Cl. 204-4.000.

Hand Widmaier Fabrik Fur Apparate Der Fernmelde-und Feinwerktechnik: *See*—
Schmid, Theobald; Widmaier, Horst; and Wolf, Friedrich, 4,531,033, Cl. 200-314.000.

Handley, Edward F.: *See*—
Caron, LaVerne A.; and Handley, Edward F., 4,530,321, Cl. 123-179.00H.

Haneda, Isamu: *See*—
Morino, Masuaki; Fujikawa, Yoshiyuki; Haneda, Isamu; and Myoi, Tetsuo, 4,531,194, Cl. 364-705.000.

Haneda, Satoshi: *See*—
Itaya, Masahiko; Haneda, Satoshi; Tarumi, Noriyoshi; and Tomono, Makoto, 4,530,595, Cl. 355-15.000.
Itaya, Masahiko; and Haneda, Satoshi, 4,530,597, Cl. 355-15.000.

Hanma, Kentaro: *See*—
Murakami, Toshio; and Hanma, Kentaro, 4,531,158, Cl. 358-227.000.

Hann, William M.; and Natoli, John, to Rohm and Haas Company. Method of inhibiting scaling in aqueous systems with low molecular weight copolymers. 4,530,766, Cl. 210-701.000.

Hara, Hiroshi; Tobioka, Takashi; Yoshino, Takeshi; Nishikawa, Tetuo; and Sekine, Jiro, to Fuji Photo Film Co., Ltd. Exposure aperture frame construction for camera. 4,530,582, Cl. 354-203.000.

Harada, Hajime; and Kojima, Takeshi, to Nihon Kohden Corporation. Physiological signal amplifier circuitry. 4,530,365, Cl. 128-696.000.

Harada, Naoki: *See*—
Omura, Takashi; Harada, Naoki; and Tezuka, Yasuo, 4,530,996, Cl. 534-642.000.

Harborchem, Inc.: *See*—
Moore, John R.; and Maybaum, Stephen, 4,530,722, Cl. 106-38.350.

Hardie-Muncy, Darlene A.: *See*—
Bannon, Glen M.; Hardie-Muncy, Darlene A.; and Wauters, Ronald P., 4,530,848, Cl. 426-293.000.

Hardwick, Geoffrey J.: *See*—
Baker, Michael J.; and Hardwick, Geoffrey J., 4,530,347, Cl. 126-360.00R.

Hargreaves, John E., to Cranston Machinery Company, Inc. Cargo hook. 4,530,535, Cl. 294-82.240.

Harley-Davidson Motor Co., Inc.: *See*—
Mezger, Hans, 4,530,315, Cl. 123-41.740.

Harper, Barrie S., to Chubb Lock & Safe Limited. Cylinder locks. 4,530,222, Cl. 70-364.00R.

Harris, Martin, to Shell Oil Company. Process for preparing insecticidal N-acyl-tetrahydro-2-nitromethylene-2H-1,3-thiazines. 4,531,002, Cl. 544-54.000.

Harris, William W., Jr.: *See*—
Keeny, Thomas R.; and Harris, William W., Jr., 4,530,687, Cl. 493-361.000.

Harrison, Richard H., Jr.: *See*—
Cates, Robert E.; Harrison, Richard H., Jr.; and Carter, Thomas P., 4,530,804, Cl. 261-30.000.

Hartman, Kathy J.; and Shu, Winston R., to Mobil Oil Corporation. Method for maximum in-situ visbreaking of heavy oil. 4,530,401, Cl. 166-303.000.

Hartwell Corporation: *See*—
Poe, Lloyd R.; and Henrichs, Bernard W., 4,530,529, Cl. 292-113.000.

Harvey, Bruce J.; Laurent, Harold J.; and Pauwels, Michael A., to Allied Corporation. Fuel control system for actuating injection means for controlling small fuel flows. 4,530,332, Cl. 123-481.000.

Hasegawa, Etsuo: *See*—
Matsushita, Yoh-ichi; Hasegawa, Etsuo; Eshima, Kiyoshi; and Tsuchida, Eishun, 4,530,794, Cl. 260-245.910.
Hasegawa, Kenichi, to Matsushita Electric Industrial Co. Ltd. Circuit for independently adjusting frequency deviation of a VCO. 4,531,155, Cl. 358-186.000.
Haselhuhn, James M.: *See*—
Mason, Arthur C.; Faitel, William M.; and Haselhuhn, James M., 4,530,637, Cl. 414-750.000.
Hashimoto Forming Kogyo Co., Ltd.: *See*—
Baba, Yuko, 4,530,484, Cl. 249-56.000.
Hashimoto, Hideki: *See*—
Shiroto, Yoshimi; Nakata, Shinichi; and Hashimoto, Hideki, 4,530,753, Cl. 208-68.000.
Shiroto, Yoshimi; Nakata, Shinichi; and Hashimoto, Hideki, 4,530,754, Cl. 208-68.000.
Hashimoto, Takayoshi: *See*—
Kawamoto, Kiyoaki; Shukuri, Kastuhiro; Hashimoto, Takayoshi; Yamazaki, Yoshio; and Inowa, Shigeru, 4,530,596, Cl. 355-15.000.
Haslam, James H. Rotary balance motor. 4,530,255, Cl. 74-604.000.
Haslam, John L.; and Pogany, Stefano A., to Merck & Co., Inc. Quinoline carboxylic acid complexes with guanidinium carbonate. 4,530,928, Cl. 514-254.000.
Hattori, Kyo: *See*—
Akagi, Motonobu; Kawabata, Yasuhiro; and Hattori, Kyo, 4,530,374, Cl. 137-625.300.
Hattori, Torao, to Honda Giken Kogyo Kabushiki Kaisha. Motor vehicle transmission having a variable pulley in parallel with an interlocking gear. 4,530,256, Cl. 74-689.000.
Hauni-Werke Korber & Co. KG: *See*—
Henle, Karl, 4,530,251, Cl. 74-89.150.
Hauptmann, Rudolf: *See*—
Beyer, Guenter; Hauptmann, Rudolf; and Peters, Rainer, 4,531,125, Cl. 343-7.900.
Havas, Jeno: *See*—
Toke, Laszlo ; Agai, Bela; Bitter, Istvan; Pungor, Erno; Szepesvary nee Toth, Klara; Lindner, Erno; Horvath, Maria; and Havas, Jeno, 4,531,007, Cl. 549-351.000.
Hawie Mfg. Co., The: *See*—
Hawie, Robert L., 4,530,617, Cl. 403-290.000.
Hawie, Robert L., to Hawie Mfg. Co., The. Assembly having adjustable tension fastener means. 4,530,617, Cl. 403-290.000.
Hayakawa, Seiji: *See*—
Oguma, Tomio; and Hayakawa, Seiji, 4,530,339, Cl. 123-561.000.
Hayami, Hiroshi; Kuroda, Yasuo; Kikuchi, Makoto; and Koshi, Kenji, to Nippon Kayaku Kabushiki Kaisha. Process for producing polychlorobenzonitrile. 4,530,797, Cl. 260-465.00C.
Hayashi, Motoshige: *See*—
Taniuchi, Akira; Nishibori, Setsuo; Komori, Hirohito; and Hayashi, Motoshige, 4,530,880, Cl. 428-402.000.
Hayden, Richard; and Neumann, Fred F., to American Safety Equipment Corporation. Integral track vehicle seat apparatus. 4,530,540, Cl. 297-341.000.
Hayman, Lawrence A., to NL Industries, Inc. High pressure seal assembly. 4,530,238, Cl. 73-431.000.
Hearst, Peter J.: *See*—
Zell, Warren E.; Imel, Charles E.; Saam, Richard D.; Hearst, Peter J.; Olah, Nicholas J.; Bialecki, Adolph; and Biggers, Rececca L., 4,530,131, Cl. 15-321.000.
Heatwole, Richard L. Amusement and/or exercising device. 4,530,498, Cl. 272-146.000.
Hedberg, Allan, to Stensele Mekaniska Verkstad AB. Cutting unit with chain saw for cutting logs. 4,530,266, Cl. 83-801.000.
Hehl, Karl. Mounting arrangement for die closing unit of injection molding machine. 4,530,655, Cl. 425-589.000.
Heise Manufacturing Co., Inc.: *See*—
Heise, Stanley R.; Blackston, Michael D.; Zekich, Michael B.; and Parselle, John L. B., 4,530,183, Cl. 49-42.000.
Heise, Stanley R.; Blackston, Michael D.; Zekich, Michael B.; and Parselle, John L. B., to Heise Manufacturing Co., Inc.; and Related Energy & Security Systems, Inc. Revolving door system. 4,530,183, Cl. 49-42.000.
Heisel, Michael; and Ranke, Gerhard, to Linde Aktiengesellschaft. Process for the simultaneous removal of H_2S, SO_2 and elemental sulfur from gaseous mixtures. 4,530,827, Cl. 423-575.000.
Helfgott, Gerald N.: *See*—
Helfgott, Maxwell A.; and Helfgott, Gerald N., 4,530,356, Cl. 128-305.000.
Helfgott, Maxwell A.; and Helfgott, Gerald N., 4,530,359, Cl. 128-329.00R.
Helfgott, Maxwell A.; and Helfgott, Gerald N. Ophthalmic surgical instrument with beveled tip. 4,530,356, Cl. 128-305.000.
Helfgott, Maxwell A.; and Helfgott, Gerald N. Ophthalmic perforating instrument and surgical method employing said instrument. 4,530,359, Cl. 128-329.00R.
Helling, Jurgen; and Rohs, Ulrich. Frictional ring gear. 4,530,257, Cl. 74-796.000.
Hendrickson, Larry L.: *See*—
Kolc, Jaroslav F.; Swerdloff, Michael D.; Rogic, Milorad M.; Hendrickson, Larry L.; and Van Der Puy, Michael, 4,530,714, Cl. 71-28.000.
Hendrix, James E.; Daniels, John Y.; and Jackson, Bobby D., to Springs Industries, Inc. Chintz fabric and method of producing same. 4,530,874, Cl. 428-266.000.
Henle, Karl, to Hauni-Werke Korber & Co. KG. Apparatus for transmitting motion to work-supporting tables of machine tools and the like. 4,530,251, Cl. 74-89.150.
Henrichs, Bernard W.: *See*—
Poe, Lloyd R.; and Henrichs, Bernard W., 4,530,529, Cl. 292-113.000.
Henriksen, Norolf, to Norsk Hydro a.s. Deaeration of water. 4,530,820, Cl. 423-219.000.
Hentschke, Siegbert, to International Standard Electric Corporation. System for the redundancy-reducing digital transmission of television video signals. 4,531,151, Cl. 358-135.000.
Heraeus Quarzschmelze GmbH: *See*—
Boog, Manfred; and Jakob, Werner, 4,530,378, Cl. 138-109.000.
Gutermann, Alfons; Herzog, Heinz; Mohn, Heinrich; and Schulke, Karl A., 4,530,818, Cl. 422-240.000.
Herchenbach, Horst; and Abelitis, Andris, to Klockner-Humboldt-Deutz AG. Apparatus for the calcination of fine grained material. 4,530,661, Cl. 432-106.000.
Hercules Incorporated: *See*—
Policelli, Frederick J., 4,530,379, Cl. 138-109.000.
Herman, Michael: *See*—
Bradley, William P.; Herman, Michael; and Paltrow, Robert W., 4,530,730, Cl. 156-227.000.
Hermann Berstorff Maschinenbau GmbH: *See*—
Koch, Klaus; Klaus, Rainer; Syrbius, Gerhard; and Schaeffer, Hans-Joachim, 4,530,761, Cl. 210-407.000.
Hermanson, Herman A.: *See*—
Drews, Reinhold E.; Fisher, Almon P.; Hermanson, Herman A.; and Pond, Stephen F., 4,531,137, Cl. 346-74.400.
Hernandez, Jose A., to Wide-Lite International, Inc. Internal shield for trough-like reflector. 4,531,180, Cl. 362-297.000.
Hershberger, Charles L.; and Rosteck, Paul R., Jr., to Eli Lilly and Company. Method for conferring bacteriophage resistance to bacteria. 4,530,904, Cl. 435-172.300.
Hershenson, Fred M.: *See*—
Butler, Donald E.; Pavia, Michael R.; and Hershenson, Fred M., 4,530,929, Cl. 514-295.000.
Herz, Harold L.; Jobes, Sam S.; Jordan, John D.; Benfey, David P.; and Wheeler, William C., to General Electric Company. High voltage power supply. 4,531,181, Cl. 363-21.000.
Herzog, Heinz: *See*—
Gutermann, Alfons; Herzog, Heinz; Mohn, Heinrich; and Schulke, Karl A., 4,530,818, Cl. 422-240.000.
Hetz, Walter, to Siemens Aktiengesellschaft. Ultrasound device for sector scanning. 4,530,362, Cl. 128-660.000.
Heymer, Gero: *See*—
Wolter, Manfred; Dorn, Friedrich-Wilhelm; Heymer, Gero; and Stephan, Hans-Werner, 4,530,769, Cl. 210-769.000.
Higashi, Toshihiko; Kobayashi, Yoshinori; and Iwasaki, Shinjiro, to Meito Sangyo Kabushiki Kaisha. Microbial rennet having increased milk coagulating activity and method and method for production thereof. 4,530,906, Cl. 435-223.000.
Hight, Andrew T.: *See*—
Davies, James F.; Hight, Andrew T.; and Lee, Robert S., 4,530,774, Cl. 252-108.000.
Hild, Berthold; Braun, Martin; and Munker, Max, to SMS Schloemann-Siemag AG. Strip-guide assembly for a metal strip coiler. 4,530,224, Cl. 72-15.000.
Hill, William F., to Lucas Industries. Position transducer for an internal combustion engine function control system. 4,531,090, Cl. 324-208.000.
Hilti Aktiengesellschaft: *See*—
Gloor, Peter; Gschwend, Hans; Mark, Fritz; and Matt, Lukas, 4,530,454, Cl. 227-129.000.
Hiniker Company: *See*—
Hiniker, Thomas K.; and Bush, Vincent N., 4,530,463, Cl. 239-71.000.
Hiniker, Thomas K.; and Bush, Vincent N., to Hiniker Company. Control method and apparatus for liquid distributor. 4,530,463, Cl. 239-71.000.
Hinton, Gordon L., to Weyerhaeuser Company. Partitioned container with collapsible bottom. 4,530,460, Cl. 229-27.000.
Hioki, Katsuhiko: *See*—
Komatsu, Tatsuyoshi; Numata, Shigeaki; Hioki, Katsuhiko; and Sumino, Toshihiko, 4,530,745, Cl. 204-130.000.
Hiraga, Ryozo: *See*—
Okutsu, Kazuhisa; Momose, Katsumi; and Hiraga, Ryozo, 4,530,604, Cl. 356-401.000.
Hirai, Kiyomiki; Takeuchi, Koji; Ito, Nobuo; and Abe, Masahiro, to Ajinomoto Co., Inc. Latent curing agents for epoxy resins. 4,530,991, Cl. 528-123.000.
Hirai, Nobuyuki: *See*—
Yamamoto, Kazushi; Nagai, Takeshi; Hirai, Nobuyuki; and Mori, Shunichiro, 4,530,464, Cl. 239-102.000.
Hiramatsu, Takeshi: *See*—
Morozumi, Mitsuharu; Ito, Yasumichi; Hiramatsu, Takeshi; and Asai, Minoru, 4,530,970, Cl. 525-193.000.
Hirano, Masachika: *See*—
Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, 4,531,008, Cl. 549-447.000.
Hirano, Masahiro; and Nakayama, Sumio, to Kabushiki Kaisha Showa Seisakusho. Spring load adjusting device for cushioning equipment. 4,530,489, Cl. 267-34.000.

Hirohashi, Kazutoshi: *See—*
Ishigaki, Yukinobu; and Hirohashi, Kazutoshi, 4,531,095, Cl. 328-165.000.

Hiromoto, Shuji: *See—*
Misumi, Atsushi; and Hiromoto, Shuji, 4,530,490, Cl. 267-47.000.

Hirs, Gene. Method of oil coagulation utilizing entrained gas. 4,530,767, Cl. 210-708.000.

Hirsbrunner, Pierre; and Bertholet, Raymond, to Nestec S. A. Betaine derivative. 4,530,799, Cl. 260-501.130.

Hirsbrunner, Pierre; and Pavillard, Blaise, to Nestec S. A. Purification of caffeine. 4,531,003, Cl. 544-275.000.

Hisajima, Masahiko: *See—*
Kimura, Hiroshi; Hisajima, Masahiko; Shibata, Kiyoshi; Irie, Yoichiro; Morimoto, Kiyoshi; Nagashima, Takashi; Yoshikawa, Yasuhiko; Watashi, Masahiro; Yamamoto, Kiyonori; Yamamoto, Toshihiko; and Yoshinaga, Shinsuke, 4,530,588, Cl. 355-3.0DR.

Hisamoto, Iwao; and Omure, Yukio, to Kaikin Kogyo Co., Ltd. Cleaning composition for wax removal. 4,530,776, Cl. 252-153.000.

Hitachi Chemical Company, Ltd.: *See—*
Mukoyama, Yoshiyuki; Sakata, Touichi; and Osada, Yuichi, 4,530,975, Cl. 525-423.000.

Hitachi Denshi Kabushiki Kaisha: *See—*
Ishizuka, Kohei; Kita, Yasuhiro; Maeda, Narimichi; Koya, Masahiro; Takaoka, Kazuhiko; and Kokuryo, Yoshiro, 4,531,089, Cl. 324-99.00D.

Hitachi, Ltd.: *See—*
Ashida, Akira, 4,531,223, Cl. 375-110.000.
Azuma, Kazufumi; Nate, Kazuo; Nakatani, Mitsuo; Yokono, Hitoshi; and Endo, Takeshi, 4,530,746, Cl. 204-159.130.
Ishizuka, Kohei; Kita, Yasuhiro; Maeda, Narimichi; Koya, Masahiro; Takaoka, Kazuhiko; and Kokuryo, Yoshiro, 4,531,089, Cl. 324-99.00D.
Kobayashi, Hiroyuki, 4,531,057, Cl. 250-311.000.
Murakami, Toshio; and Hanma, Kentaro, 4,531,158, Cl. 358-227.000.
Nakayama, Takeshi; Kurosu, Masaaki; Ohshima, Yoshimitsu; Fujikata, Kenji; Uchida, Shigeru; and Nakajima, Akira, 4,531,119, Cl. 340-712.000.
Nakazato, Norio; Yoshimatsu, Sachihiro; Nawata, Makoto; and Masuda, Sadao, 4,530,708, Cl. 62-13.000.
Sato, Katsutoshi; Itoh, Susumu; and Aoshima, Masaru, 4,530,428, Cl. 193-40.000.

HLF Corporation: *See—*
Levine, Paul J., 4,531,023, Cl. 179-2.00R.

Hobart Brothers Company: *See—*
Kemp, Gerrit V., 4,531,045, Cl. 219-132.000.

Hobbs, Edwin L. Leg protector and socket for climbers. 4,530,420, Cl. 182-221.000.

Hodaka Kogyo K.K.: *See—*
Okamura, Shigeo; Sato, Yoshihiro; and Takahashi, Kenji, 4,530,140, Cl. 29-110.000.

Hoechst Aktiengeselischaft: *See—*
Berghaeuser, Gunter; Schell, Loni; and Frass, Werner, 4,530,897, Cl. 430-302.000.
Donges, Reinhard; and Horn, Klaus, 4,530,747, Cl. 204-159.160.
Scharf, Udo; and Schlingmann, Merten, 4,530,785, Cl. 260-112.00R.
Simon, Ulrich; and Beutel, Rainer, 4,530,895, Cl. 430-145.000.
Wiedemann, Wolfgang, 4,530,892, Cl. 430-78.000.
Wolter, Manfred; Dorn, Friedrich-Wilhelm; Heymer, Gero; and Stephan, Hans-Werner, 4,530,769, Cl. 210-769.000.

Hoff, Raymond E.: *See—*
Pullukat, Thomas J.; and Hoff, Raymond E., 4,530,912, Cl. 502-104.000.
Pullukat, Thomas J.; and Hoff, Raymond E., 4,530,913, Cl. 502-104.000.

Hoffman, Philip A., to Solid State Chargers Research and Development Limited Partnership. Current regulating circuit. 4,531,083, Cl. 320-9.000.

Hoffman, Philip A., to Solid State Chargers Research and Development Limited Partnership. Power supply with current regulating circuit. 4,531,084, Cl. 320-39.000.

Hoffmann, Ludwig: *See—*
Weyrich, Claus; Ziegler, Guenther; Hoffmann, Ludwig; and Theis, Dietmar, 4,531,142, Cl. 357-17.000.

Hofmann GmbH: *See—*
Beilstein, Kurt H., 4,530,470, Cl. 241-169.100.

Hofmann, Helmut J., to Selero Limited. Swimming pool cleaner component. 4,530,125, Cl. 15-1.700.

Hohyu Rubber Co., Ltd.: *See—*
Nakahira, Akitaro, 4,530,386, Cl. 152-315.000.

Holbein, Bruce E.: *See—*
DeVoe, Irving W.; and Holbein, Bruce E., 4,530,963, Cl. 525-54.100.

Holder, Billy W.: *See—*
Rounkles, Rodney G.; and Holder, Billy W., 4,530,466, Cl. 239-327.000.

Holder, James D., to United States of America, Army. Electron beam stimulated electromagnetic radiation generator. 4,531,076, Cl. 315-4.000.

Holka, Leon G. Can opener tool. 4,530,260, Cl. 81-3.550.

Holl, Roland: *See—*
Mathes, Josef; Abendroth, Paul; Holl, Roland; and Seikel, Wolfgang, 4,530,283, Cl. 101-230.000.

Hollister Incorporated: *See—*
Schneider, Barry L., 4,530,525, Cl. 285-200.000.

Holloway, Kenneth A. Method for applying a splint. 4,530,352, Cl. 128-89.00R.

Hollymatic Corporation: *See—*
Wagner, Richard C., 4,530,132, Cl. 17-45.000.

Holman, George B., Jr.: *See—*
Smith, Robert C.; and Holman, George B., Jr., 4,530,402, Cl. 166-291.000.

Holmberg, John M., to Boart International Limited. Connection of drill tubes. 4,530,527, Cl. 285-382.400.

Holmberg, Scott H., to Burroughs Corporation. Aluminum-refractory metal interconnect with anodized periphery. 4,531,144, Cl. 357-71.000.

Holter, Heinz; Igelbuscher, Heinrich; Gresch, Heinrich; and Dewert, Heribert, to Holter, Heinz. Apparatus for the protection of air fed to a labor-protection or vehicle compartment. 4,530,817, Cl. 422-122.000.

Holzle, Gerd: *See—*
Polony, Rudolf; Reinert, Gerhard; Holzle, Gerd; Pugin, Andre ; and Vonderwahl, Rodolphe, 4,530,924, Cl. 514-191.000.

Homan, Gary R.; and Stickles, David L., to Dow Corning Corporation. Coating method and silicone composition for PSA release coating. 4,530,882, Cl. 428-452.000.

Honda Giken Kogyo K.K.: *See—*
Yamazaki, Ryutarou, 4,530,210, Cl. 60-605.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Hattori, Torao, 4,530,256, Cl. 74-689.000.
Honda, Shoichi, 4,530,319, Cl. 123-90.460.
Kurata, Noboru; and Ito, Toshifumi, 4,530,681, Cl. 474-111.000.
Sakata, Mamoru; and Minakawa, Masaaki, 4,530,415, Cl. 180-297.000.
Tagami, Katsutoshi; Takahashi, Tsuneo; Yasui, Shinichiro; and Ichikawa, Akira, 4,531,123, Cl. 340-995.000.

Honda, Shoichi, to Honda Giken Kogyo Kabushiki Kaisha; and Nittan Valve Co., Ltd. Hydraulic lash adjustor in a valve operating mechanism. 4,530,319, Cl. 123-90.460.

Honeywell Inc.: *See—*
McCullough, John B.; and Mortensen, Craig A., 4,531,059, Cl. 250-370.000.
Meyerhoff, Hans P., 4,530,854, Cl. 427-162.000.
Starr, James B., 4,530,244, Cl. 73-727.000.

Honma, Akira: *See—*
Furuta, Toshio; Kawamoto, Nobuhiko; and Honma, Akira, 4,530,621, Cl. 405-150.000.

Hopkins, Linda L.: *See—*
Hopkins, Thomas R.; and Hopkins, Linda L., 4,530,606, Cl. 366-129.000.

Hopkins, Thomas R.; and Hopkins, Linda L. Apparatus for stirring solutions in small vessels. 4,530,606, Cl. 366-129.000.

Horky, John W., to Babson Bros. Co. Dispenser filling apparatus and method. 4,530,370, Cl. 134-57.00R.

Horlander, Frank J., to International Business Machines Corporation. Regulated voltage and approximate constant power for thermal printhead. 4,531,134, Cl. 346-76.0PH.

Horman, Richard; and Rettke, Wilfried, to Triumph-Adler Aktiengesellschaft fur Buro- und Informationstechnik. Device for monitoring paper in typewriters and similar machines. 4,530,613, Cl. 400-708.000.

Horn, Gavriel: *See—*
Bar-on, Yair; and Horn, Gavriel, 4,531,237, Cl. 455-343.000.

Horn, Jorg. Method of making extrudable thermoplastic molding material for manufacturing plastic sheeting used in protective covers, especially for vehicles and parts thereof. 4,530,732, Cl. 156-244.180.

Horn, Klaus: *See—*
Donges, Reinhard; and Horn, Klaus, 4,530,747, Cl. 204-159.160.

Horvath, Istvan: *See—*
Machovich, Raymund; Nagy, Miklos; Gyorgyi nee Edelenyi, Judit; Horvath, Istvan; Low, Miklos; Csomor, Katalin; Karpati, Egon; Szporny, Laszlo ; and Kisfaludy, Lajos, 4,530,964, Cl. 525-61.000.

Horvath, Kalman: *See—*
Kuhlemann, Bruce N.; Horvath, Kalman; and Wharff, Prentice C., 4,530,697, Cl. 604-263.000.

Horvath, Maria: *See—*
Toke, Laszlo ; Agai, Bela; Bitter, Istvan; Pungor, Erno; Szepesvary nee Toth, Klara; Lindner, Erno; Horvath, Maria; and Havas, Jeno, 4,531,007, Cl. 549-351.000.

Hosel, Fritz, to Trutzschler GmbH & Co. Kg. Computerized control system for a carding machine. 4,530,134, Cl. 19-105.000.

Hosiden Electronics Co., Ltd.: *See—*
Katsube, Kazuaki; and Kuwabara, Masami, 4,530,557, Cl. 339-75.00M.

Hoss, Robert E.: *See—*
Lewallen, Steve F.; Lewis, Billy J.; McIver, James R.; Hoss, Robert E.; and Pierce, Edward W., 4,530,853, Cl. 427-113.000.

Hotovy, James R., to Wickes Corporation, The. In-bin, controlled atmosphere, grain drying systems and the like. 4,530,167, Cl. 34-47.000.

Hovekamp, John C., to Graphic Enterprises of Ohio, Inc. Coating device for plates. 4,530,306, Cl. 118-669.000.

Hovey, Elmer L. Sighting device. 4,530,163, Cl. 33-265.000.

Hoya Electronics Co., Ltd.: *See—*
Nagarekawa, Osamu; and Matsui, Shigekazu, 4,530,891, Cl. 430-5.000.

Hsiang, Kuo M. Roller wheel baler. 4,530,135, Cl. 24-68.0CD.

Hsieh, Wen-Ching; and Koepke, Jeffery W., to Union Oil Company of California. Process for enhanced oil recovery employing synthetic sulfonates and petroleum sulfonate blends. 4,530,400, Cl. 166-273.000.

Huber, Joel E., to Upjohn Company, The. Process for preparation of 16 α-methyl corticoids from Δ^{16}-steroids. 4,530,795, Cl. 260-397.400.
Hubner, Wolfgang; Klein, Helmut; Goldacker, Erhard; and Schroers, Otto, to Chemische Fabrik Stockhausen GmbH. Process for the rapid dissolution of water-soluble polymers. 4,530,943, Cl. 523-318.000.
Hudson, James M.: *See*—
Dunbar, Bohn D.; Niswender, Gordon D.; and Hudson, James M., 4,530,786, Cl. 260-112.00B.
Hudson, L. Keith: *See*—
Schlesinger, Allen H.; Hudson, L. Keith; and Fish, William M., 4,530,699, Cl. 23-301.000.
Huffman, William A., to Minnesota Mining and Manufacturing Company. Substituted anthraquinone-type isotropic dyes for liquid crystal display devices. 4,530,572, Cl. 350-346.000.
Huggins, Hal A. Composition and method for evaluating sensitivity to metals. 4,530,364, Cl. 128-670.000.
Hughes Aircraft Company: *See*—
Close, Donald H., 4,530,564, Cl. 350-3.690.
Hummel, Werner: *See*—
Leuchtenberger, Wolfgang; Kula, Maria-Regina; Hummel, Werner; and Schutte, Horst, 4,530,903, Cl. 435-130.000.
Hunke, Friedrich: *See*—
Philipp, Heinrich; Lettner, Horst H.; and Hunke, Friedrich, 4,530,649, Cl. 425-71.000.
Hunton, John H.: *See*—
Thurber, Charles H., Jr.; Behrens, Frederick A.; and Hunton, John H., 4,530,476, Cl. 244-3.210.
Hurley, Timothy R.: *See*—
Bunge, Richard H.; French, James C.; Hurley, Timothy R.; Smitka, Tim A.; and Tunac, Josefino B., 4,530,835, Cl. 424-117.000.
Hurst, David R.: *See*—
Atkinson, Alan W.; Hurst, David R.; and Somerfield, Kenneth T., 4,530,949, Cl. 523-512.000.
Hurt, Henry W.; and May, Charles F., to Reynolds, John Barryman, a part interest. Drive for elevating mechanism. 4,530,174, Cl. 37-8.000.
Huster, Heinrich P. High voltage electrical insulator with arcing horn. 4,531,018, Cl. 174-140.00R.
Huttunen, Jouko: *See*—
Selin, Johan-Fredrik; Huttunen, Jouko; Turunen, Olli; Fors, Jan; Eklund, Vidar; and Ekman, Kurt, 4,530,999, Cl. 536-30.000.
Hvezda, Jaroslav M.: *See*—
Velsher, Benne; Hvezda, Jaroslav M.; and Middlehurst, Richard J., 4,530,554, Cl. 339-17.00M.
Hyatt, Gilbert P. Machine control system operating from remote commands. 4,531,182, Cl. 364-131.000.
Hyde, Lawrence L. Astigmatic ruler and method of use thereof. 4,530,579, Cl. 351-212.000.
Hydraunit Venture: *See*—
Whatley, David L.; and Chaviers, Wallace M., 4,530,645, Cl. 417-399.000.
I.S.F. Spa: *See*—
Ciavenna, Gaetano; Farina, Carlo; Pinza, Mario; and Pifferi, Giorgio, 4,530,934, Cl. 514-548.000.
Ichikawa, Akira: *See*—
Tagami, Katsutoshi; Takahashi, Tsuneo; Yasui, Shinichiro; and Ichikawa, Akira, 4,531,123, Cl. 340-995.000.
Ichinose, Toshio, to Diesel Kiki Company, Ltd. Injection timing control device for internal combustion engine. 4,530,336, Cl. 123-502.000.
Ide, Satoshi: *See*—
Enjo, Naonori; Noguchi, Masahiro; and Ide, Satoshi, 4,530,773, Cl. 252-67.000.
Ideal Industries, Inc.: *See*—
Voss, Roy N.; and Peplow, Marvin J., 4,530,472, Cl. 242-55.300.
Idesawa, Isao: *See*—
Fukuzawa, Genichiro; and Idesawa, Isao, 4,530,424, Cl. 188-196.00D.
Igelbuscher, Heinrich: *See*—
Holter, Heinz; Igelbuscher, Heinrich; Gresch, Heinrich; and Dewert, Heribert, 4,530,817, Cl. 422-122.000.
Igielska, Jadwiga, to Transconsultants AB. Guide system for use on a ship. 4,530,628, Cl. 410-40.000.
Iijima, Akihiro: *See*—
Tanaka, Toshiaki; Miyazaki, Hiroaki; Etoh, Yukihiro; Kanesaki, Nobukazu; and Iijima, Akihiro, 4,530,324, Cl. 123-300.000.
Iizuka, Hisakazu: *See*—
Masuoka, Fujio; and Iizuka, Hisakazu, 4,531,203, Cl. 365-218.000.
Iizuka, Kazuo: *See*—
Kosugi, Masao; Konuki, Tadashi; and Iizuka, Kazuo, 4,530,587, Cl. 355-53.000.
Iizuka, Shigeo: *See*—
Nozawa, Takamitsu; Kishi, Takao; and Iizuka, Shigeo, 4,530,449, Cl. 222-189.000.
Ikemoto, Kazuhito; Terakura, Yukio; and Miyake, Takashi, to Toyota Jidosha Kabushiki Kaisha. Gear assembly for automobile gear transmission. 4,530,253, Cl. 74-440.000.
Ikushima, Koichi; Tanaka, Hirokazu; Osamu, Ohe; Kino, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Arakawa, Akira; and Imanaka, Hiroshi, to Fujisawa Pharmaceutical Co., Ltd. 1,4-Napthoquinone derivatives and use thereof. 4,530,845, Cl. 514-453.000.
Illi, Jozsef: *See*—
Czegledi, Bela; Csovari, Mihaly; Erdelyi, Miklos; Illi, Jozsef; Stocker, Lajos; Szoke, Attila; Szabo nee Mogyorosi, Katalin; Riederauer, Szilard; Urmossy, Miklos; Terenyi, Gyula; and Csurgai, Istvan, 4,530,819, Cl. 423-112.000.
Illinois Tool Works Inc.: *See*—
Felstehausen, Eugene F., 4,530,264, Cl. 83-175.000.
Imamura, Tetsuya; Takeuchi, Takashi; Tetsutani, Takashi; and Yasuda, Shinichiro, to Kao Corporation. Coated magnetic toner powder. 4,530,894, Cl. 430-106.600.
Imanaka, Hiroshi: *See*—
Ikushima, Koichi; Tanaka, Hirokazu; Osamu, Ohe; Kino, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Arakawa, Akira; and Imanaka, Hiroshi, 4,530,845, Cl. 514-453.000.
Imatron Associates: *See*—
Peschmann, Kristian R., 4,531,226, Cl. 378-143.000.
Imchemie Kunststoff GmbH: *See*—
Melchior, Bernd, 4,530,806, Cl. 264-22.000.
Imel, Charles E.: *See*—
Zell, Warren E.; Imel, Charles E.; Saam, Richard D.; Hearst, Peter J.; Olah, Nicholas J.; Bialecki, Adolph; and Biggers, Rececca L., 4,530,131, Cl. 15-321.000.
IMNETEC Inc.: *See*—
Smith, Leonard E.; and Johnson, James, 4,530,496, Cl. 272-68.000.
Imperial Chemical Industries PLC: *See*—
Jones, Michael E. B., 4,530,992, Cl. 528-232.000.
Williams, Ian G., 4,530,951, Cl. 524-101.000.
Inaba, Hajimu; Sakakibara, Shinsuke; and Nihei, Ryo, to Fujitsu Fanuc Limited. Device for operating a hand of an industrial robot. 4,530,636, Cl. 414-730.000.
Inaba, Hiroshi, to Nitsuko Limited. Key switch devices with indicator lamp means. 4,531,034, Cl. 200-314.000.
Inagaki, Kouichi, to Mitsubishi Denki Kabushiki Kaisha. Method of producing a contact device for a switch. 4,530,815, Cl. 419-8.000.
Inaguma, Hideo, to Yamauchi Rubber Industry Co., Ltd. Rubber roller for spinning. 4,530,866, Cl. 428-36.000.
Indesit Industrial Elettrodometici Italiana S.p.A.: *See*—
Alluto, Luigi; and Fancelli, Fabio, 4,530,217, Cl. 62-156.000.
Ingenieursbureau A. P. Van den Berg B.V.: *See*—
van den Berg, Arie P., 4,530,236, Cl. 73-84.000.
Ingenjorsfirman Alf Andersson Handelsbolag: *See*—
Andersson, Alf H., 4,530,462, Cl. 239-7.000.
Ingersoll-Rand Company: *See*—
Arya, Satya P., 4,530,409, Cl. 173-131.000.
Inoue, Hiroshi: *See*—
Kasari, Akira; Ohira, Kazuhiko; and Inoue, Hiroshi, 4,530,958, Cl. 524-512.000.
Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,530,471, Cl. 242-45.000.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Method of and apparatus for dispensing wire from a wire storage spool. 4,530,471, Cl. 242-45.000.
Inoue, Toshihide; and Komatsu, Hideo, to Toray Industries, Inc. Process for preparing α,ω-bis(2-chlorophenoxy)alkane-4,4'-dicarboxylic acid or its lower alkyl ester. 4,531,009, Cl. 560-65.000.
Inoue, Yoshihiro: *See*—
Okada, Yoshiyuki; Inoue, Yoshihiro; and Iwanaga, Koichi, 4,531,005, Cl. 548-116.000.
Inoue, Yoshihisa: *See*—
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,530,926, Cl. 514-214.000.
Inowa, Shigeru: *See*—
Kawamoto, Kiyoaki; Shukuri, Kastuhiro; Hashimoto, Takayoshi; Yamazaki, Yoshio; and Inowa, Shigeru, 4,530,596, Cl. 355-15.000.
Institute of Critical Care Medicine: *See*—
Bisera, Jose; and Weil, Max H., 4,530,696, Cl. 604-253.000.
Integrated Systems Engineering, Inc.: *See*—
Brown, Brent W., 4,531,121, Cl. 340-764.000.
International Business Machines Corporation: *See*—
Banker, Dennis C.; Montegari, Frank A.; and Norsworthy, John P., 4,531,067, Cl. 307-454.000.
Brownell, Kendrick C., Jr.; and Scrutchin, Thomas W., Jr., 4,531,120, Cl. 340-723.000.
Butera, William J.; and Stucki, Peter, 4,530,612, Cl. 400-232.000.
Halpern, Joseph Y.; Simons, Barbara B.; and Strong, Hovey R., 4,531,185, Cl. 364-200.000.
Horlander, Frank J., 4,531,134, Cl. 346-76.0PH.
Knapman, John M., 4,531,186, Cl. 364-300.000.
Kraft, Wayne R.; Moore, Victor S.; Stahl, William L., Jr.; and Thoma, Nandor G., 4,531,068, Cl. 307-473.000.
Mutter, Walter E., 4,530,736, Cl. 156-643.000.
Pedersen, Raymond J., 4,531,199, Cl. 364-900.000.
Sonu, Gene H.; and Schneider, Richard C., 4,531,165, Cl. 360-65.000.
Stokes, Konrad H., 4,530,272, Cl. 98-33.00A.
Whitley, Lawrence D., 4,531,200, Cl. 364-900.000.
International Harvester Company: *See*—
Caron, LaVerne A.; and Handley, Edward F., 4,530,321, Cl. 123-179.00H.
International In-Store Sales Limited: *See*—
Prewer, Richard W., 4,530,200, Cl. 53-157.000.
International Jensen Incorporated: *See*—
Bell, R. Richard, 4,531,234, Cl. 455-247.000.
International Playtex, Inc.: *See*—
Wooten, Thomas P., 4,530,361, Cl. 128-483.000.
International Shoe Machine Corporation: *See*—
Sommer, Gerald, 4,530,124, Cl. 12-12.400.
International Standard Electric Corporation: *See*—
Foster, Basil B., 4,531,222, Cl. 375-106.000.
Hentschke, Siegbert, 4,531,151, Cl. 358-135.000.
Pioli, Maurizio, 4,531,022, Cl. 178-22.190.

Intersonics Incorporated: *See—*
Danley, Thomas J.; and Rey, Charles A., 4,531,025, Cl. 179-115.5VC.
Intervascular, Inc.: *See—*
Matterson, Samuel A., 4,530,113, Cl. 623-1.000.
Ipri, Alfred C.: *See—*
Jastrzebski, Lubomir L.; Ipri, Alfred C.; and Kokkas, Achilles G., 4,530,149, Cl. 29-571.000.
Irie, Yoichiro: *See—*
Kimura, Hiroshi; Hisajima, Masahiko; Shibata, Kiyoshi; Irie, Yoichiro; Morimoto, Kiyoshi; Nagashima, Takashi; Yoshikawa, Yasuhiko; Watashi, Masahiro; Yamamoto, Kiyonori; Yamamoto, Toshihiko; and Yoshinaga, Shinsuke, 4,530,588, Cl. 355-3.0DR.
Isaacson, Calvin: *See—*
Christensen, Carl W.; and Isaacson, Calvin, 4,530,896, Cl. 430-155.000.
Iseki, Masahide: *See—*
Kajita, Hiroshi; Iseki, Masahide; Nakajima, Tadanobu; and Kawamori, Yoshizo, 4,530,598, Cl. 355-75.000.
Ishibashi, Takashi: *See—*
Suzuki, Toshitake; Arai, Naoto; Aoyagi, Shoji; Saito, Toranosuke; Kitani, Masakatu; and Ishibashi, Takashi, 4,531,140, Cl. 346-209.000.
Ishida, Akira: *See—*
Okano, Masami; Tanaka, Akimasa; Suzuki, Takeshi; Ishida, Akira; and Miyazaki, Tatsuo, 4,531,039, Cl. 219-60.00R.
Ishigaki, Yukinobu; and Hirohashi, Kazutoshi, to Victor Company of Japan, Limited. Impulse noise reduction by linear interpolation having immunity to white noise. 4,531,095, Cl. 328-165.000.
Ishiguro, Fujio, to NGK Insulators, Ltd. Electrochemical cell and method of producing the same. 4,530,751, Cl. 204-424.000.
Ishihara, Hiroyuki, to Nippon Electric Co., Ltd. Microwave integrated circuit frequency converter. 4,531,236, Cl. 455-302.000.
Ishii, Hakumi: *See—*
Toyoda, Shuhei; Yokoya, Yuji; and Ishii, Hakumi, 4,530,254, Cl. 74-493.000.
Ishii, Keizou: *See—*
Kanda, Kazunori; Ishii, Keizou; Kida, Katsuaki; Ishikura, Shinichi; and Mizuguchi, Ryuzo, 4,530,946, Cl. 523-418.000.
Ishii, Yasuo, to United States Gypsum Company. Apparatus for forming embossed acoustical tile. 4,530,653, Cl. 425-363.000.
Ishikawa, Katsuji, to West Electric Co., Ltd. Method and apparatus for automatic focusing in video camera. 4,531,157, Cl. 358-227.000.
Ishikura, Shinichi: *See—*
Kanda, Kazunori; Ishii, Keizou; Kida, Katsuaki; Ishikura, Shinichi; and Mizuguchi, Ryuzo, 4,530,946, Cl. 523-418.000.
Ishizuka, Kohei; Kita, Yasuhiro; Maeda, Narimichi; Koya, Masahiro; Takaoka, Kazuhiko; and Kokuryo, Yoshiro, to Hitachi, Ltd.; and Hitachi Denshi Kabushiki Kaisha. Electric power detecting circuit and gain control circuit using the same. 4,531,089, Cl. 324-99.00D.
Ishizuka, Masaaki: *See—*
Umezawa, Hamao; Takeuchi, Tomio; Ishizuka, Masaaki; Takita, Tomohisa; Shimada, Nobuyoshi; and Kato, Kuniki, 4,530,998, Cl. 536-24.000.
Isowa, Eiichi, to Isowa Industry Co., Ltd. Die-cutting apparatus. 4,530,693, Cl. 493-342.000.
Isowa Industry Co., Ltd.: *See—*
Isowa, Eiichi, 4,530,693, Cl. 493-342.000.
Itabashi, Keiji: *See—*
Arika, Junji; Itabashi, Keiji; and Tamura, Yoshio, 4,530,824, Cl. 423-328.000.
ITALCEMENTI Fabgriche Riunite Cemento S.p.A.: *See—*
Bucchi, Renato, 4,530,651, Cl. 425-94.000.
Itaya, Masahiko; Haneda, Satoshi; Tarumi, Noriyoshi; and Tomono, Makoto, to Konishiroku Photo Industry Co., Ltd. Toner cleaning method and apparatus in which voltage is impressed between electrostatic image holder and a film member. 4,530,595, Cl. 355-15.000.
Itaya, Masahiko; and Haneda, Satoshi, to Konishiroku Photo Industry Co., Ltd. Brush cleaning device. 4,530,597, Cl. 355-15.000.
Itaya, Nobushige: *See—*
Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, 4,531,008, Cl. 549-447.000.
Itek Corporation: *See—*
Ehn, Dennis C., 4,531,160, Cl. 358-240.000.
Ito, Hideo, to Nissan Motor Company, Limited. Toe-out change preventive swing-arm vehicle suspension. 4,530,514, Cl. 280-701.000.
Ito, Hisakatsu: *See—*
Nakayama, Masahito; Iwasaki, Akio; Kimura, Shigeru; Tanabe, Sohei; Mizoguchi, Toshimi; Murakami, Akira; Watanabe, Isamu; Okuchi, Masao; Ito, Hisakatsu; and Mori, Toshihito, 4,530,791, Cl. 260-245.20T.
Ito, Nobuo: *See—*
Hirai, Kiyomiki; Takeuchi, Koji; Ito, Nobuo; and Abe, Masahiro, 4,530,991, Cl. 528-123.000.
Ito, Toshifumi: *See—*
Kurata, Noboru; and Ito, Toshifumi, 4,530,681, Cl. 474-111.000.
Ito, Toshio; Futakawa, Akemi; and Nakazaki, Osamu, to Mitsubishi Denki Kabushiki Kaisha. Fluttering kite. 4,530,477, Cl. 244-153.00R.
Ito, Yasumichi: *See—*
Morozumi, Mitsuharu; Ito, Yasumichi; Hiramatsu, Takeshi; and Asai, Minoru, 4,530,970, Cl. 525-193.000.
Itoh, Hiroshi: *See—*
Chikaraishi, Takayo; and Itoh, Hiroshi, 4,530,184, Cl. 49-213.000.
Itoh, Shigeru: *See—*
Ueno, Ryuzo; Tsuchiya, Hiroaki; and Itoh, Shigeru, 4,530,724, Cl. 106-288.00Q.
Itoh, Susumu: *See—*
Sato, Katsutoshi; Itoh, Susumu; and Aoshima, Masaru, 4,530,428, Cl. 193-40.000.
ITT Industries, Inc.: *See—*
Carlsson, Valdemar, 4,530,643, Cl. 416-144.000.
Steffes, Helmut, 4,530,209, Cl. 60-547.100.
Weiler, Rolf; Kretzer, Horst; Leidecker, Hans-Dieter; and Gerhardt, Winfried, 4,530,506, Cl. 277-212.0FB.
Iuchi, Koji: *See—*
Uno, Toshio; Takamatsu, Masanori; Iuchi, Koji; and Tsukamoto, Goro, 4,530,930, Cl. 514-312.000.
Iwabuchi, Suminobu: *See—*
Kagawa, Hiroshi; and Iwabuchi, Suminobu, 4,530,151, Cl. 29-623.100.
Iwanaga, Koichi: *See—*
Okada, Yoshiyuki; Inoue, Yoshihiro; and Iwanaga, Koichi, 4,531,005, Cl. 548-116.000.
Iwasaki, Akio: *See—*
Nakayama, Masahito; Iwasaki, Akio; Kimura, Shigeru; Tanabe, Sohei; Mizoguchi, Toshimi; Murakami, Akira; Watanabe, Isamu; Okuchi, Masao; Ito, Hisakatsu; and Mori, Toshihito, 4,530,791, Cl. 260-245.20T.
Iwasaki, Shinjiro: *See—*
Higashi, Toshihiko; Kobayashi, Yoshinori; and Iwasaki, Shinjiro, 4,530,906, Cl. 435-223.000.
Iwase, Hidehiro: *See—*
Mayama, Toshio; and Iwase, Hidehiro, 4,530,779, Cl. 252-507.000.
Iwatsu Electric Co., Ltd.: *See—*
Shibano, Fumehiko, 4,531,092, Cl. 324-244.000.
Iyengar, Mike; and Gallagher, Gail, to American Hospital Supply Corporation. Heat-radiating cover for food plates. 4,530,344, Cl. 126-246.000.
Izu, Masatsugu: *See—*
Hanak, Joseph J.; Nath, Prem; Izu, Masatsugu; and Young, James, 4,530,739, Cl. 204-4.000.
J. C. Penney Co., Inc.: *See—*
Gaber, Ira; and Lawrence, Harry E., III, 4,530,539, Cl. 297-174.000.
J. I. Case Company: *See—*
Allen, John J.; and Meitl, Harold G., 4,530,537, Cl. 296-1.00C.
Mylander, Richard H., 4,530,426, Cl. 192-4.00A.
Skeel, James C., 4,530,427, Cl. 192-4.00A.
Jackson, Bobby D.: *See—*
Hendrix, James E.; Daniels, John Y.; and Jackson, Bobby D., 4,530,874, Cl. 428-266.000.
Jacob, Gernot; and Maier, Robert, to Progress-Electrogerate Mauz & Pfeiffer GmbH & Co. Motor driven cylindrical brush for a cleaning apparatus. 4,530,128, Cl. 15-182.000.
Jacobson, Earl B. Modular reactor head shielding system. 4,530,813, Cl. 376-287.000.
Jacobson, Walter E., to Revere Corporation of America. Strain measuring apparatus and method of making same. 4,530,245, Cl. 73-768.000.
Jakob, Werner: *See—*
Boog, Manfred; and Jakob, Werner, 4,530,378, Cl. 138-109.000.
Jakobsen, Kjell M.; and Nilsson, Claes T., to PLM Aktiebolag. Process for the manufacture of a blank for a container. 4,530,811, Cl. 264-521.000.
James River - Norwalk, Inc.: *See—*
Maroszek, Raymond V., 4,530,459, Cl. 229-23.00R.
Janke, Donald E.; and Linstromberg, William J., to Whirlpool Corporation. Refrigeration apparatus defrost control. 4,530,218, Cl. 62-156.000.
Janome Sewing Machine Industry Co., Ltd.: *See—*
Takenoya, Hideaki; Kuribayashi, Nobumitu; and Shomura, Eiichi, 4,530,296, Cl. 112-229.000.
Jaquet, Andre , to Sig Societe Industrielle Suisse. Railway work machine. 4,531,053, Cl. 250-201.000.
Jasperse, Philip D.; Weis, Siegfried K.; and Sovis, Milo D., Jr., to FROCEMCO, Inc. Conveyor roll bearing. 4,530,609, Cl. 384-482.000.
Jastrzebski, Lubomir L.; Ipri, Alfred C.; and Kokkas, Achilles G., to RCA Corporation. Method for fabricating a self-aligned vertical IGFET. 4,530,149, Cl. 29-571.000.
Jedynak, Leo: *See—*
Bluestein, Leo I.; Crandell, Paul E.; Drake, David A.; Jedynak, Leo; and Simpson, Larry W., 4,531,021, Cl. 178-22.080.
Wechselberger, Anthony J.; Bluestein, Leo I.; Jedynak, Leo; Drake, David A.; and Simpson, Larry W., 4,531,020, Cl. 178-22.080.
Jeneric Industries, Inc.: *See—*
Prasad, Arun; and Day, Grant P., 4,530,664, Cl. 433-207.000.
Jenkins, David C.: *See—*
Adamski, Maximillian; Jenkins, David C.; and Kosrow, Robert L., 4,530,295, Cl. 112-121.120.
Jerabek, Robert D.: *See—*
Christenson, Roger M.; Scriven, Roger L.; Jerabek, Robert D.; Koren, Jeffrey G.; and Johnson, Mark W., 4,530,945, Cl. 523-400.000.
Jesinsky, Edward G., Jr. Excessive pronation correcting device. 4,530,173, Cl. 36-92.000.
Jeumont-Schneider Corporation: *See—*
Simon, Daniel, 4,530,567, Cl. 350-96.200.
Jinda, Takuma; Matsuda, Toshikazu; and Sakamoto, Masanori, to Director General of Agency of Industrial Science & Technology.

Poly 2,2'-dichloro-4,4'-biphenylene pyromellitimide film. 4,530,993, Cl. 528-353.000.

Jobes, Sam S.: *See*—
Herz, Harold L.; Jobes, Sam S.; Jordan, John D.; Benfey, David P.; and Wheeler, William C., 4,531,181, Cl. 363-21.000.

Johannes Heidenhain GmbH: *See*—
Ernst, Alfons, 4,530,159, Cl. 33-169.00R.
Feichtinger, Kurt, 4,530,160, Cl. 33-559.000.

Johansson, Thomas, to KemaNord AB. Process for the production of silicon nitride. 4,530,825, Cl. 423-344.000.

Johns Hopkins University, The: *See*—
Strand, Mette, 4,530,908, Cl. 436-536.000.

Johnson, Carl A., to Owens-Corning Fiberglas Corporation. Migration-free size for glass fibers. 4,530,860, Cl. 427-386.000.

Johnson, Curtis A.: *See*—
Renlund, Gary M.; and Johnson, Curtis A., 4,530,808, Cl. 264-63.000.

Johnson, David W., Jr.; and Robbins, Murray, to AT&T Bell Laboratories. Negative temperature coefficient thermistors. 4,531,110, Cl. 338-22.00R.

Johnson, Gerald D.; and Powell, Roger W., to Westinghouse Electric Corp. Austenitic stainless steel for high temperature applications. 4,530,719, Cl. 75-124.000.

Johnson, James: *See*—
Smith, Leonard E.; and Johnson, James, 4,530,496, Cl. 272-68.000.

Johnson, James W.: *See*—
Burns, Edgar; Johnson, James W.; and Kimbrough, Adele R., 4,530,559, Cl. 339-90.00R.

Johnson & Johnson Products, Inc.: *See*—
Lauritzen, Nels J., 4,530,353, Cl. 128-156.000.

Johnson, Lawrence N. Boat trailer with pivotal dropped cross bar roller mounting system. 4,530,634, Cl. 414-534.000.

Johnson, Mark W.: *See*—
Christenson, Roger M.; Scriven, Roger L.; Jerabek, Robert D.; Koren, Jeffrey G.; and Johnson, Mark W., 4,530,945, Cl. 523-400.000.

Johnson, Stephen G.: *See*—
Dullea, Leonard V.; Loughridge, Frederick A.; and Johnson, Stephen G., 4,530,710, Cl. 65-56.000.

Johnson, William R., Jr.: *See*—
Thompson, Larry D.; and Johnson, William R., Jr., 4,530,727, Cl. 148-2.000.

Johnston, Jeffrey J.: *See*—
Ladewski, Chester T.; Chapman, Harry A.; and Johnston, Jeffrey J., 4,531,215, Cl. 371-67.000.

Jones, John A., to American Optical Corporation. Respirator cartridge end-of-service life indicator. 4,530,706, Cl. 55-275.000.

Jones, Mark B.; and Fowler, Allan E., to Dow Chemical Company, The. Selective absorption of SO_2 from gases containing the same. 4,530,704, Cl. 55-48.000.

Jones, Michael E. B., to Imperial Chemical Industries PLC. Aromatic oligomers and resins. 4,530,992, Cl. 528-232.000.

Jones, Robert: *See*—
Goldstein, Seth R.; and Jones, Robert, 4,530,698, Cl. 604-271.000.

Jordan, John D.: *See*—
Herz, Harold L.; Jobes, Sam S.; Jordan, John D.; Benfey, David P.; and Wheeler, William C., 4,531,181, Cl. 363-21.000.

Jordans, Josef: *See*—
Meurer, Hans; and Jordans, Josef, 4,530,225, Cl. 72-52.000.

Joseph, Ian N., to Bendix Limited. Pressure proportioning valves. 4,530,544, Cl. 303-22.00R.

Joy Manufacturing Company: *See*—
Peters, Clifford M., 4,530,377, Cl. 137-637.200.

Jude Engineering, Inc.: *See*—
Christian, Robert F., 4,530,432, Cl. 198-662.000.

Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich; and Brunner, Josef, 4,530,547, Cl. 308-3.800.

Junkosha Co., Ltd.: *See*—
Sato, Shunichi, 4,531,049, Cl. 219-549.000.

K A Bergs Smide AB: *See*—
Fredriksson, Lars O. A., 4,530,534, Cl. 294-82.110.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Yoshinada, Hiroshi; Oshima, Hiroshi; and Ono, Takashi, 4,531,082, Cl. 318-663.000.

Kabushiki Kaisha Okawara Seisakusho: *See*—
Okawara, Mikio, 4,530,169, Cl. 34-57.00E.

Kabushiki Kaisha Showa Seisakusho: *See*—
Hirano, Masahiro; and Nakayama, Sumio, 4,530,489, Cl. 267-34.000.

Kabushiki Kaisha Toshiba: *See*—
Toshima, Akira, 4,531,135, Cl. 346-76.0PH.

Kabushiki Kaisha Ueno Seiyaku Uno Kenkyujo: *See*—
Ueno, Ryuzo; Tsuchiya, Hiroaki; and Itoh, Shigeru, 4,530,724, Cl. 106-288.00Q.

Kadi, Frank J., to Air Products and Chemicals, Inc. Economical and thermally efficient cryopump panel and panel array. 4,530,213, Cl. 62-55.500.

Kadi, Frank J., to Air Products and Chemicals, Inc. Method and apparatus for distinguishing between different gas or gas mixtures using a flow tube. 4,530,233, Cl. 73-23.000.

Kaeppel, Hanshelmut: *See*—
Woerner, Frank P.; Reimann, Horst; Mahnke, Harald; Neumann, Peter; Turznik, Gerhard; and Kaeppel, Hanshelmut, 4,530,940, Cl. 521-124.000.

Kagawa, Hiroshi; and Iwabuchi, Suminobu, to Yuasa Battery Co., Ltd. Manufacture method of a sodium-sulfur storage battery. 4,530,151, Cl. 29-623.100.

Kageyama, Yoshiteru: *See*—
Matsuura, Mitsuyuki; Kageyama, Yoshiteru; Hagiwara, Akito; and Shimada, Takeo, 4,530,983, Cl. 526-125.000.

Kaikin Kogyo Co., Ltd.: *See*—
Hisamoto, Iwao; and Omure, Yukio, 4,530,776, Cl. 252-153.000.

Kaizuma, Hisayuki; and Hakamada, Haruo, to Konishiroku Photo Industry Co., Ltd. Photographic printer. 4,530,599, Cl. 355-75.000.

Kajita, Hiroshi; Iseki, Masahide; Nakajima, Tadanobu; and Kawamori, Yoshizo, to Mita Industrial Co., Ltd. Electrostatic copying apparatus. 4,530,598, Cl. 355-75.000.

Kaminski, Elton G.; and McEldowney, Carl F., to Stolle Corporation, The. Pull tab for easy open can end-method of manufacture thereof. 4,530,631, Cl. 413-12.000.

Kamochi, Atsumi: *See*—
Aya, Masahiro; Yasui, Kazuomi; and Kamochi, Atsumi, 4,530,717, Cl. 71-90.000.

Kanai, Masaharu, to Fuji Photo Film Co., Ltd. Automatic strobe apparatus. 4,530,585, Cl. 354-416.000.

Kanda, Kazunori; Ishii, Keizou; Kida, Katsuaki; Ishikura, Shinichi; and Mizuguchi, Ryuzo, to Nippon Paint Co., Ltd. Resinous emulsion comprising microparticles for coating use and preparation thereof. 4,530,946, Cl. 523-418.000.

Kanda, Mutsumi; Matsushita, Souichi; and Nakanishi, Kiyoshi, to Toyota Jidosha Kabushiki Kaisha. Piston with crown cooling cavity and radial ribs formed therein. 4,530,312, Cl. 123-41.350.

Kane Graphical Corporation: *See*—
Kane, Michael, 4,530,177, Cl. 40-621.000.

Kane, Michael, to Kane Graphical Corporation. Sign with interchangeable characters. 4,530,177, Cl. 40-621.000.

Kanebo, Ltd.: *See*—
Uno, Toshio; Takamatsu, Masanori; Iuchi, Koji; and Tsukamoto, Goro, 4,530,930, Cl. 514-312.000.

Kaneko, Nobuo; Takemoto, Takeshi; and Yasuda, Hiroshi, to Ricoh Company, Ltd.; and Ricoh Watch Co., Ltd. Printing hammer assembly with a hammer dampener comprising two opposed permanent magnets. 4,530,280, Cl. 101-93.020.

Kaneko, Satoshi, to Tamura Electric Works, Ltd. Tape counter. 4,531,050, Cl. 235-1.00D.

Kanesaki, Nobukazu: *See*—
Tanaka, Toshiaki; Miyazaki, Hiroaki; Etoh, Yukihiro; Kanesaki, Nobukazu; and Iijima, Akihiro, 4,530,324, Cl. 123-300.000.

Kansaki Paper Manufacturing Co. Ltd.: *See*—
Suzuki, Toshitake; Arai, Naoto; Aoyagi, Shoji; Saito, Toranosuke; Kitani, Masakatu; and Ishibashi, Takashi, 4,531,140, Cl. 346-209.000.

Kanzai Paint Company, Limited: *See*—
Kasari, Akira; Ohira, Kazuhiko; and Inoue, Hiroshi, 4,530,958, Cl. 524-512.000.

Kao Corporation: *See*—
Abe, Yoshiaki, 4,530,829, Cl. 424-70.000.
Imamura, Tetsuya; Takeuchi, Takashi; Tetsutani, Takashi; and Yasuda, Shinichiro, 4,530,894, Cl. 430-106.600.

Kaplan, Gerald S.; and Setzer, Russell G., to RCA Corporation. Apparatus and method for reducing telephone channel power loading. 4,531,208, Cl. 370-7.000.

Karonite Chemical Co., Ltd.: *See*—
Nakano, Takaharu; Mochizuki, Akihiro; Nakazato, Morikuni; and Tsuneno, Tatsuro, 4,530,771, Cl. 252-49.600.

Karpati, Egon: *See*—
Machovich, Raymund; Nagy, Miklos; Gyorgyi nee Edelenyi, Judit; Horvath, Istvan; Low, Miklos; Csomor, Katalin; Karpati, Egon; Szporny, Laszlo ; and Kisfaludy, Lajos, 4,530,964, Cl. 525-61.000.

Kasari, Akira; Ohira, Kazuhiko; and Inoue, Hiroshi, to Kanzai Paint Company, Limited. Thermosetting metallic coating compositions. 4,530,958, Cl. 524-512.000.

Kashimoto, Kazuhisa: *See*—
Yanaihara, Noboru; Sugiura, Nobuo; and Kashimoto, Kazuhisa, 4,530,836, Cl. 514-16.000.

Kassai, Denes P., to FMC Corporation. Hydrostatic propulsion system and method with inching throttle and brake. 4,530,416, Cl. 180-307.000.

Kasugai, Shouzi; and Sawato, Tatsuya, to Mitsubishi Denki Kabushiki Kaisha. Device for preventing separation of a belt from a motor pulley. 4,530,683, Cl. 474-144.000.

Kasuya, Yukio; Yagasaki, Toshiaki; and Masuda, Shunichi, to Canon Kabushiki Kaisha. Image forming apparatus with attachment. 4,530,593, Cl. 355-14.00R.

Kato, Kinya, to Nippon Kogaku K. K. Variable magnification observation apparatus. 4,530,578, Cl. 350-526.000.

Kato, Kuniki: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Ishizuka, Masaaki; Takita, Tomohisa; Shimada, Nobuyoshi; and Kato, Kuniki, 4,530,998, Cl. 536-24.000.

Kato, Yoshiaki: *See*—
Nawa, Akiyoshi; Kato, Yoshiaki; and Shimizu, Takao, 4,531,040, Cl. 219-74.000.

Katsube, Kazuaki; and Kuwabara, Masami, to Sony Corporation; and Hosiden Electronics Co., Ltd. Microminiature connector. 4,530,557, Cl. 339-75.00M.

Katsuura, Nobuo; and Furusawa, Takashi, to Nikko Kogyo Kabushiki Kaisha. Locking and releasing device for use with a panel plate. 4,530,615, Cl. 403-16.000.

Kauffman, William J.; and Wright, Ralph W., to Armstrong World Industries, Inc. Method for making decorative laminate. 4,530,856, Cl. 427-197.000.

Kaufman, Benjamin J.: *See—*
Sung, Rodney L.; Sweeney, William M.; and Kaufman, Benjamin J., 4,530,802, Cl. 260-925.000.

Kaufman, David E.: *See—*
Burnham, Charles A.; Bradshaw, John F., Jr.; Kaufman, David E.; Chesler, David A.; and Brownell, Gordon L., 4,531,058, Cl. 250-363.00S.

Kaufman, Martin H. Solar collector system for heating fluids. 4,530,348, Cl. 126-444.000.

Kawabata, Yasuhiro: *See—*
Akagi, Motonobu; Kawabata, Yasuhiro; and Hattori, Kyo, 4,530,374, Cl. 137-625.300.

Kawai, Yasuhiro, to Fuji Photo Film Co., Ltd. Image scanning system having a reversibly rotatable sub-scanning drum. 4,530,590, Cl. 355-8.000.

Kawamori, Yoshizo: *See—*
Kajita, Hiroshi; Iseki, Masahide; Nakajima, Tadanobu; and Kawamori, Yoshizo, 4,530,598, Cl. 355-75.000.

Kawamoto, Kiyoaki; Shukuri, Kastuhiro; Hashimoto, Takayoshi; Yamazaki, Yoshio; and Inowa, Shigeru, to Konishiroku Photo Industry Co., Ltd. Electrostatic copying apparatus. 4,530,596, Cl. 355-15.000.

Kawamoto, Nobuhiko: *See—*
Furuta, Toshio; Kawamoto, Nobuhiko; and Honma, Akira, 4,530,621, Cl. 405-150.000.

Kawasaki Kasei Chemicals Ltd.: *See—*
Komatsu, Tatsuyoshi; Numata, Shigeaki; Hioki, Katsuhiko; and Sumino, Toshihiko, 4,530,745, Cl. 204-130.000.

Kay, Edward L.: *See—*
Gutierrez, Richard; Kay, Edward L.; and Serbin, David J., 4,530,995, Cl. 528-930.000.

Kay, William E. Hole boring apparatus and method. 4,530,410, Cl. 175-57.000.

Kaymen, Joseph. Golf ball position marker and storage device. 4,530,500, Cl. 273-32.00A.

Keane, James W., to Whirlpool Corporation. Plastic wheel having an annular bearing support. 4,530,543, Cl. 301-63.0PW.

Kearns, Robert L.: *See—*
Sippel, David F.; and Kearns, Robert L., 4,530,861, Cl. 427-444.000.

Kearns, Robert W. Variable bias logic circuit. 4,531,066, Cl. 307-445.000.

Keef, Sherron M.: *See—*
Sawyer, Willard C.; Sawyer, Edith M.; Keef, Sherron M.; and Sawyer, John W., 4,530,700, Cl. 44-1.00E.

Keeny, Thomas R.; and Harris, William W., Jr., to Molins Machine Company, Inc. Dual cutoff system having diverging web paths. 4,530,687, Cl. 493-361.000.

Keiper Recarco GmbH & Co.: *See—*
Kluting, Bernd; Ebeling, Peter; and Strowik, Willibald, 4,530,481, Cl. 248-394.000.

Keiper Recaro GmbH & Co.: *See—*
Resag, Jorg; and Schmale, Gerhard, 4,530,541, Cl. 297-452.000.

Kekish, George T.: *See—*
Koskan, Larry P.; Kugel, Roger W.; and Kekish, George T., 4,530,701, Cl. 44-51.000.

Kelley, Arnold E.: *See—*
Deering, Roland F.; Gowdy, Hugh W.; and Kelley, Arnold E., 4,530,752, Cl. 208-11.00R.

Kelly, Joseph D.: *See—*
Duffer, Paul F.; Franz, Helmut; and Kelly, Joseph D., 4,530,889, Cl. 428-326.000.

Kelman, Charles D. Surgical instrument for and method of inserting a posterior chamber lens in an eye. 4,530,117, Cl. 623-6.000.

KemaNord AB: *See—*
Johansson, Thomas, 4,530,825, Cl. 423-344.000.

Kemp, Gerrit V., to Hobart Brothers Company. Trigger hold circuit for welding power supply. 4,531,045, Cl. 219-132.000.

Kemp, Willard E. Through conduit gate valve with double expanding gate assembly. 4,530,488, Cl. 251-167.000.

Kennedy, Richard B., to Crehan & Fricke. Polyurethane foams and processes for preparation. 4,530,777, Cl. 252-182.000.

Kent Manufacturing Co., Inc.: *See—*
Hake, Kenneth A.; and Hamilton, Gregory A., 4,530,406, Cl. 172-705.000.

Kerzel, David, to Spraymation, Inc. Control system and method for dispensing a liquid. 4,530,862, Cl. 427-445.000.

Keszthelyi nee Udvary, Eva: *See—*
Rakoczi, Jozsef; Berenyi nee Poldermann, Edit; Fekete, Bela; Szekeres, Laszlo; Papp, Gyula; and Keszthelyi nee Udvary, Eva, 4,530,923, Cl. 514-183.000.

Kettlestrings, John S. Infinite radius circle drawing instrument. 4,530,156, Cl. 33-27.00R.

Kida, Katsuaki: *See—*
Kanda, Kazunori; Ishii, Keizou; Kida, Katsuaki; Ishikura, Shinichi; and Mizuguchi, Ryuzo, 4,530,946, Cl. 523-418.000.

Kijima, Takao; Maebayashi, Jiro; and Ando, Fumitaka, to Mazda Motor Corporation. Vehicle rear suspension mechanism. 4,530,513, Cl. 280-701.000.

Kikuchi, Makoto: *See—*
Hayami, Hiroshi; Kuroda, Yasuo; Kikuchi, Makoto; and Koshi, Kenji, 4,530,797, Cl. 260-465.00C.

Kimbrough, Adele R.: *See—*
Burns, Edgar; Johnson, James W.; and Kimbrough, Adele R., 4,530,559, Cl. 339-90.00R.

Kimura, Hiroshi; Hisajima, Masahiko; Shibata, Kiyoshi; Irie, Yoichiro; Morimoto, Kiyoshi; Nagashima, Takashi; Yoshikawa, Yasuhiko; Watashi, Masahiro; Yamamoto, Kiyonori; Yamamoto, Toshihiko; and Yoshinaga, Shinsuke, to Mita Industrial Co., Ltd. Mount for a rotating drum and a developer within an electrostatic copying apparatus. 4,530,588, Cl. 355-3.0DR.

Kimura, Kenji, to Olympus Optical Co., Ltd. Method and apparatus for detecting tracking error. 4,531,206, Cl. 369-44.000.

Kimura, Shigeru: *See—*
Nakayama, Masahito; Iwasaki, Akio; Kimura, Shigeru; Tanabe, Sohei; Mizoguchi, Toshimi; Murakami, Akira; Watanabe, Isamu; Okuchi, Masao; Ito, Hisakatsu; and Mori, Toshihito, 4,530,791, Cl. 260-245.20T.

Kinderman, Gerard H.; and Sanders, James F., to Minnesota Mining and Manufacturing Company. Lithographic fountain concentrate. 4,530,721, Cl. 106-2.000.

King, James D.: *See—*
Rollwitz, William L.; and King, James D., 4,531,093, Cl. 324-300.000.

King, Taylor: *See—*
Whitehurst, Brooks M.; Clemens, Donald F.; King, Taylor; and Whitehurst, Garnett B., 4,530,735, Cl. 156-642.000.

Kino, Eiko: *See—*
Ikushima, Koichi; Tanaka, Hirokazu; Osamu, Ohe; Kino, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Arakawa, Akira; and Imanaka, Hiroshi, 4,530,845, Cl. 514-453.000.

Kinoshita, Tatsuo: *See—*
Nambu, Masao; and Kinoshita, Tatsuo, 4,530,220, Cl. 62-530.000.

Kintz, Lawrence J., Jr.; and Rossie, Joseph F., to Sundstrand Corporation. Rotor assembly. 4,531,071, Cl. 310-156.000.

Kisfaludy, Lajos: *See—*
Machovich, Raymund; Nagy, Miklos; Gyorgyi nee Edelenyi, Judit; Horvath, Istvan; Low, Miklos; Csomor, Katalin; Karpati, Egon; Szporny, Laszlo; and Kisfaludy, Lajos, 4,530,964, Cl. 525-61.000.

Kishi, Norimasa: *See—*
Noso, Kazunori; Kishi, Norimasa; and Futami, Toru, 4,531,228, Cl. 381-46.000.

Kishi, Takao: *See—*
Nozawa, Takamitsu; Kishi, Takao; and Iizuka, Shigeo, 4,530,449, Cl. 222-189.000.

Kita, Yasuhiro: *See—*
Ishizuka, Kohei; Kita, Yasuhiro; Maeda, Narimichi; Koya, Masahiro; Takaoka, Kazuhiko; and Kokuryo, Yoshiro, 4,531,089, Cl. 324-99.00D.

Kitamura, Takashi, to Canon Kabushiki Kaisha. Semiconductor laser device with plural light sources. 4,531,217, Cl. 372-50.000.

Kitani, Masakatu: *See—*
Suzuki, Toshitake; Arai, Naoto; Aoyagi, Shoji; Saito, Toranosuke; Kitani, Masakatu; and Ishibashi, Takashi, 4,531,140, Cl. 346-209.000.

Klaus, Rainer: *See—*
Koch, Klaus; Klaus, Rainer; Syrbius, Gerhard; and Schaeffer, Hans-Joachim, 4,530,761, Cl. 210-407.000.

Kleeberg, Heinz: *See—*
Engemann, Detlef; Fischer, Dieter; and Kleeberg, Heinz, 4,531,062, Cl. 250-578.000.

Klein, Helmut: *See—*
Hubner, Wolfgang; Klein, Helmut; Goldacker, Erhard; and Schroers, Otto, 4,530,943, Cl. 523-318.000.

Klima, Walter F. Low energy ion etching. 4,530,734, Cl. 156-628.000.

Kline, Albert E.: *See—*
Greenlee, Donald R.; and Kline, Albert E., 4,530,398, Cl. 166-123.000.

Klingenstein, Walter: *See—*
Fink, Roland; Bartos, Hubert; Noschilla, Herbert; and Klingenstein, Walter, 4,530,391, Cl. 164-155.000.

Klockner-Humboldt-Deutz AG: *See—*
Herchenbach, Horst; and Abelitis, Andris, 4,530,661, Cl. 432-106.000.

Kluting, Bernd; Ebeling, Peter; and Strowik, Willibald, to Keiper Recarco GmbH & Co. Seat rail. 4,530,481, Cl. 248-394.000.

Knapman, John M., to International Business Machines Corporation. User friendly data base access. 4,531,186, Cl. 364-300.000.

Knapp, Larry I.; and Drees, Terry P., to Formica Corporation. Complementary color high pressure decorative laminate. 4,530,883, Cl. 428-503.000.

Knauer, Scott C., to AT&T Bell Laboratories. Self-routing steering network. 4,531,209, Cl. 370-56.000.

Knight, Malcolm R. M.: *See—*
Pitman, Kelvin G.; Grime, David A.; and Knight, Malcolm R. M., 4,530,246, Cl. 73-799.000.

Knittel, Helmut: *See—*
Ostertag, Werner; Dimroth, Peter; Wienand, Henning; Liedek, Egon; Knittel, Helmut; and Etzrodt, Gunter, 4,530,725, Cl. 106-298.000.

Kobayashi, Hiroyuki, to Hitachi, Ltd. Apparatus and method for adjusting optical axis of electron microscope. 4,531,057, Cl. 250-311.000.

Kobayashi, Yoshinori: *See—*
Higashi, Toshihiko; Kobayashi, Yoshinori; and Iwasaki, Shinjiro, 4,530,906, Cl. 435-223.000.

Kobler, Ingo; and Petersen, Godber, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Sheet, or sheet package transport and rotation apparatus, and method. 4,530,694, Cl. 493-425.000.

Koch, Klaus; Klaus, Rainer; Syrbius, Gerhard; and Schaeffer, Hans-Joachim, to Hermann Berstorff Maschinenbau GmbH. Extrusion devices. 4,530,761, Cl. 210-407.000.

Koepke, Jeffery W.: *See*—
Hsieh, Wen-Ching; and Koepke, Jeffery W., 4,530,400, Cl. 166-273.000.

Kohsaka, Masanobu: *See*—
Ikushima, Koichi; Tanaka, Hirokazu; Osamu, Ohe; Kino, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Arakawa, Akira; and Imanaka, Hiroshi, 4,530,845, Cl. 514-453.000.

Koide, Tsuyoshi; and Maruyama, Toshio, to Toyoda Koki Kabushiki Kaisha. Dressing device for grinding wheels. 4,530,187, Cl. 51-165.870.

Koizumi, Hideo: *See*—
Fukuhara, Yoshio; and Koizumi, Hideo, 4,531,227, Cl. 378-144.000.

Kojima, Takeshi: *See*—
Harada, Hajime; and Kojima, Takeshi, 4,530,365, Cl. 128-696.000.

Kojo, Hidehiko; and Akimoto, Koji, to Asahi Denka Kogyo K.K. Anticorrosive coating composition. 4,530,947, Cl. 523-450.000.

Kokkas, Achilles G.: *See*—
Jastrzebski, Lubomir L.; Ipri, Alfred C.; and Kokkas, Achilles G., 4,530,149, Cl. 29-571.000.

Kokuryo, Yoshiro: *See*—
Ishizuka, Kohei; Kita, Yasuhiro; Maeda, Narimichi; Koya, Masahiro; Takaoka, Kazuhiko; and Kokuryo, Yoshiro, 4,531,089, Cl. 324-99.00D.

Kolc, Jaroslav F.; Swerdloff, Michael D.; Rogic, Milorad M.; Hendrickson, Larry L.; and Van Der Puy, Michael, to Allied Corporation. N-aliphatic and N,N-aliphatic phosphoric triamide urease inhibitors and urease inhibited urea based fertilizer compositions. 4,530,714, Cl. 71-28.000.

Komatsu, Hideo: *See*—
Inoue, Toshihide; and Komatsu, Hideo, 4,531,009, Cl. 360-65.000.

Komatsu, Nobiru: *See*—
Sugie, Masuo; Kurihara, Koji; Aiba, Yoshiro; Komatsu, Nobiru; Ootuka, Haruo; and Nishikido, Kaoru, 4,530,864, Cl. 428-35.000.

Komatsu, Tatsuyoshi; Numata, Shigeaki; Hioki, Katsuhiko; and Sumino, Toshihiko, to Kawasaki Kasei Chemicals Ltd. Method for electrolyzing cerous sulfate. 4,530,745, Cl. 204-130.000.

Kommoss, Klaus: *See*—
Sarges, Heidrun; Kommoss, Klaus; and Schutte, Valentin H., 4,530,252, Cl. 74-388.00R.

Komori, Hirohito: *See*—
Taniuchi, Akira; Nishibori, Setsuo; Komori, Hirohito; and Hayashi, Motoshige, 4,530,880, Cl. 428-402.000.

Komurasaki, Satoshi, to Mitsubishi Denki Kabushiki Kaisha. Ignition timing controller for internal combustion engine. 4,530,328, Cl. 123-425.000.

Kondo, Isao, to Olympus Optical Company Ltd. Power supply unit for electronic flash. 4,530,550, Cl. 315-241.00P.

Kondo, Kenshi, to Nihon Den-Netsu Keiki Co., Ltd. Soldering apparatus. 4,530,458, Cl 728-180.100.

Konishiroku Photo Industry Co., Ltd.: *See*—
Amano, Tadashi, 4,531,150, Cl. 358-76.000.
Itaya, Masahiko; Haneda, Satoshi; Tarumi, Noriyoshi; and Tomono, Makoto, 4,530,595, Cl. 355-15.000.
Itaya, Masahiko; and Haneda, Satoshi, 4,530,597, Cl. 355-15.000.
Kaizuma, Hisayuki; and Hakamada, Haruo, 4,530,599, Cl. 355-75.000.
Kawamoto, Kiyoaki; Shukuri, Kastuhiro; Hashimoto, Takayoshi; Yamazaki, Yoshio; and Inowa, Shigeru, 4,530,596, Cl. 355-15.000.

Konkle, Douglas R., to Sunline Hardware, Inc. Bayonet-type latch mechanism with positive locking function. 4,530,136, Cl. 24-608.000.

Konuki, Tadashi: *See*—
Kosugi, Masao; Konuki, Tadashi; and Iizuka, Kazuo, 4,530,587, Cl. 355-53.000.

Kopf, J. David. Pipette puller. 4,530,712, Cl. 65-270.000.

Kordomenos, Panagiotis I.; Kurple, Kenneth R.; and Alexander, Delores J., to Ford Motor Company. Flexible uni-basecoat/two component clearcoat coating compositions. 4,530,976, Cl. 525-440.000.

Koren, Jeffrey G.: *See*—
Christenson, Roger M.; Scriven, Roger L.; Jerabek, Robert D.; Koren, Jeffrey G.; and Johnson, Mark W., 4,530,945, Cl. 523-400.000.

Koshi, Kenji: *See*—
Hayami, Hiroshi; Kuroda, Yasuo; Kikuchi, Makoto; and Koshi, Kenji, 4,530,797, Cl. 260-465.00C.

Koskan, Larry P.; Kugel, Roger W.; and Kekish, George T., to Nalco Chemical Company. Process of manufacturing a co-fuel additive with combustion-modifying effects. 4,530,701, Cl. 44-51.000.

Kosmowski, Wojciech B. Pinless router. 4,530,627, Cl. 409-80.000.

Kosrow, Robert L.: *See*—
Adamski, Maximillian; Jenkins, David C.; and Kosrow, Robert L., 4,530,295, Cl. 112-121.120.

Koster, Robert A.; and Traugott, Tom D., to Dow Chemical Company, The. Transparent impact resistant polymeric compositions and process for the preparation thereof. 4,530,973, Cl. 525-310.000.

Kosugi, Masao; Konuki, Tadashi; and Iizuka, Kazuo, to Canon Kabushiki Kaisha. Step type mask aligner. 4,530,587, Cl. 355-53.000.

Kotthaus, Erich, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. End cutter head, for gear cutting machines, cutters for end cutter heads and method for refacing said cutters. 4,530,623, Cl. 407-22.000.

Kouyama, Toshitake, to Nippon Electric Co., Ltd. Digital memory color framing circuit. 4,531,147, Cl. 358-13.000.

Kowa Co., Ltd.: *See*—
Nakayama, Masahito; Iwasaki, Akio; Kimura, Shigeru; Tanabe, Sohei; Mizoguchi, Toshimi; Murakami, Akira; Watanabe, Isamu; Okuchi, Masao; Ito, Hisakatsu; and Mori, Toshihito, 4,530,791, Cl. 260-245.20T.

Kowatsch, Hermann: *See*—
Gotz, Laszlo; and Kowatsch, Hermann, 4,531,097, Cl. 330-254.000.

Koya, Masahiro: *See*—
Ishizuka, Kohei; Kita, Yasuhiro; Maeda, Narimichi; Koya, Masahiro; Takaoka, Kazuhiko; and Kokuryo, Yoshiro, 4,531,089, Cl. 324-99.00D.

Koyachi, Hiroshi: *See*—
Miyabayashi, Yoshiyuki; Koyachi, Hiroshi; and Kurosawa, Yukihiro, 4,530,517, Cl. 280-752.000.

Koyama, Kiyomi, to Tokyo Shibaura Denki Kabushiki Kaisha. Electron beam pattern generation system. 4,531,191, Cl. 364-491.000.

Kozuki, Susumu: *See*—
Maeda, Masaya; Takimoto, Hiroyuki; and Kozuki, Susumu, 4,531,164, Cl. 360-33.100.

Kraatz, Udo: *See*—
Kranz, Eckart; Buchel, Karl H.; Kraatz, Udo; Regel, Erik; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Lurssen, Klaus, 4,530,715, Cl. 71-76.000.

Kraft, Wayne R.; Moore, Victor S.; Stahl, William L., Jr.; and Thoma, Nandor G., to International Business Machines Corporation. Bus line precharging tristate driver circuit. 4,531,068, Cl. 307-473.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Von Schwerdtner, Otto; Gossen, Hans; Gunther, Jurgen; and Peters, Hans, 4,530,212, Cl. 60-657.000.

Kramer, Daniel E. Refrigeration compressor with pump actuated oil return. 4,530,215, Cl. 62-84.000.

Kramer, Manfred: *See*—
Bohm, Martin; Kramer, Manfred; and Schwartz, Reinhard, 4,530,327, Cl. 123-357.000.

Kranz, Eckart; Buchel, Karl H.; Kraatz, Udo; Regel, Erik; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Lurssen, Klaus, to Bayer Aktiengesellschaft. Cycloalkyl (α-triazolyl-β-hydroxy)-ketones as fungicides and plant growth regulators. 4,530,715, Cl. 71-76.000.

Krarup, Peter: *See*—
Lund, Svend A.; Krarup, Peter; and Kristensen, Thorkild, 4,530,243, Cl. 73-633.000.

Krauss-Maffei Aktiengesellschaft: *See*—
Eichlseder, Martin; and Burkle, Erwin, 4,530,605, Cl. 366-79.000.

Krautwald, Herbert: *See*—
Foissner, Herbert; Krautwald, Herbert; and Minke, Lutz, 4,531,019, Cl. 174-163.00F.

Krespan, Carl G., to Du Pont de Nemours, E. I., and Company. Alkyl perfluoro-omega-(2-iodoethoxy) compounds and vinyl ethers therefrom. 4,531,011, Cl. 560-184.000.

Kretzer, Horst: *See*—
Weiler, Rolf; Kretzer, Horst; Leidecker, Hans-Dieter; and Gerhardt, Winfried, 4,530,506, Cl. 277-212.0FB.

Krimsky, Leonard C.: *See*—
Lee, Frank X.; Krimsky, Leonard C.; and Van Rietschoten, Henk, 4,530,265, Cl. 83-337.000.

Kristensen, Thorkild: *See*—
Lund, Svend A.; Krarup, Peter; and Kristensen, Thorkild, 4,530,243, Cl. 73-633.000.

Kroupa, Petr: *See*—
Zverina, Karel; Tluchor, Denek; Szabo, Josef; Polidor, Jaromir; and Kroupa, Petr, 4,531,043, Cl. 219-121.0PP.

Krueger, Harold L. Tire handling device. 4,530,388, Cl. 157-1.220.

Krupp-Koppers GmbH: *See*—
Diemer, Peter, 4,530,821, Cl. 423-238.000.

Kubiak, Jerome: *See*—
Granzow, Carl F.; Lash, Edward G.; Gleason, Everett; and Kubiak, Jerome, 4,530,226, Cl. 72-171.000.

Kubota, Yoshitaka: *See*—
Shinmi, Hideo; and Kubota, Yoshitaka, 4,530,868, Cl. 428-57.000.

Kuckens, Alexander. Apparatus for impregnating water with carbon dioxide. 4,530,803, Cl. 261-29.000.

Kugel, Roger W.: *See*—
Koskan, Larry P.; Kugel, Roger W.; and Kekish, George T., 4,530,701, Cl. 44-51.000.

Kuhlemann, Bruce N.; Horvath, Kalman; and Wharff, Prentice C., to Miles Laboratories, Inc. Needle assembly. 4,530,697, Cl. 604-263.000.

Kuhn, Earl C., to Westinghouse Electric Corp. Turbine generator hydrogen filtration system. 4,531,070, Cl. 310-56.000.

Kula, Maria-Regina: *See*—
Leuchtenberger, Wolfgang; Kula, Maria-Regina; Hummel, Werner; and Schutte, Horst, 4,530,903, Cl. 435-130.000.

Kumar, Mahesh, to RCA Corporation. Frequency multiplier circuit for producing isolated odd and even harmonics. 4,531,105, Cl. 333-117.000.

Kuramochi, Kazuo: *See*—
Suwa, Kyoichi; Kuramochi, Kazuo; and Nakazawa, Kiwao, 4,531,060, Cl. 250-548.000.

Kurata, Noboru; and Ito, Toshifumi, to Honda Giken Kogyo Kabushiki Kaisha. Chain tensioner. 4,530,681, Cl. 474-111.000.

Kuribayashi, Nobumitu: *See*—
Takenoya, Hideaki; Kuribayashi, Nobumitu; and Shomura, Eiichi, 4,530,296, Cl. 112-229.000.

Kurihara, Koji: *See*—
Sugie, Masuo; Kurihara, Koji; Aiba, Yoshiro; Komatsu, Nobiru; Ootuka, Haruo; and Nishikido, Kaoru, 4,530,864, Cl. 428-35.000.

Kurihara, Shigeru: *See*—
Ohashi, Hiroyuki; Miyamoto, Shoichi; and Kurihara, Shigeru, 4,530,826, Cl. 423-376.000.
Kuroda, Yasuo: *See*—
Hayami, Hiroshi; Kuroda, Yasuo; Kikuchi, Makoto; and Koshi, Kenji, 4,530,797, Cl. 260-465.00C.
Kurosawa, Yukihiro: *See*—
Miyabayashi, Yoshiyuki; Koyachi, Hiroshi; and Kurosawa, Yukihiro, 4,530,517, Cl. 280-752.000.
Kurosu, Masaaki: *See*—
Nakayama, Takeshi; Kurosu, Masaaki; Ohshima, Yoshimitsu; Fujikata, Kenji; Uchida, Shigeru; and Nakajima, Akira, 4,531,119, Cl. 340-712.000.
Kurple, Kenneth R.: *See*—
Kordomenos, Panagiotis I.; Kurple, Kenneth R.; and Alexander, Delores J., 4,530,976, Cl. 525-440.000.
Kurtz, Richard R., to Upjohn Company, The. Dimetronidazole phosphates. 4,531,004, Cl. 548-112.000.
Kusenberger, Felix N.; Lozano, Albert S.; and Tarver, Wilson B., Jr., to United States of America, Transportation. Magnetic inspection of reinforcing steel using sensor array. 4,531,091, Cl. 324-242.000.
Kuwabara, Masami: *See*—
Katsube, Kazuaki; and Kuwabara, Masami, 4,530,557, Cl. 339-75.00M.
L.J.N. Toys, Ltd.: *See*—
Mednick, Mel; and Weiss, Karyn, 4,530,671, Cl. 446-320.000.
L. Schuler GmbH: *See*—
Flamme, Walter; and Rahn, Oskar, 4,530,148, Cl. 29-568.000.
Labick, Richard A.; and Spector, George. Disposable toothbrush. 4,530,129, Cl. 15-184.000.
Labowsky, Michael J.; Fenn, John B.; and Yamashita, Masamichi, to Yale University. Method and apparatus for the mass spectrometric analysis of solutions. 4,531,056, Cl. 250-288.000.
Lades, Hans: *See*—
Zollner, Dieter; Lauterbach-Dammler, Inge; Taube, Thomas; Lades, Hans; Liebel, Siegfried; and Bauer, Hanns-Georg, 4,531,219, Cl. 373-101.000.
Ladewski, Chester T.; Chapman, Harry A.; and Johnston, Jeffrey J., to GTE Automatic Electric Incorporated. Validity checking arrangement for extended memory mapping of external devices. 4,531,215, Cl. 371-67.000.
Lagana, Carlo: *See*—
Geri, Sergio; Moggi, Giovanni; and Lagana, Carlo, 4,530,971, Cl. 525-199.000.
Laganza, Joseph L.: *See*—
Engelbrecht, Orest; and Laganza, Joseph L., 4,530,635, Cl. 414-627.000.
Lai, Chung J.: *See*—
Thomas, Iran L.; and Lai, Chung J., 4,530,764, Cl. 210-637.000.
Lamarche, Paul E., to Borg-Warner Corporation. Series spring vibration dampers. 4,530,673, Cl. 464-64.000.
Lamb Technicon Corp.: *See*—
Mason, Arthur C.; Faitel, William M.; and Haselhuhn, James M., 4,530,637, Cl. 414-750.000.
Lamberti, Vincent; and Gutierrez, Eddie N., to Lever Brothers Company. Nopol derived sulfonates. 4,530,801, Cl. 260-503.000.
Lang, Wilhelm: *See*—
Seiler, Ernst; and Lang, Wilhelm, 4,530,205, Cl. 57-9.000.
Lannen Tehtaat Oy: *See*—
Lehtinen, Jouko; and Saarinen, Kari, 4,530,383, Cl. 141-71.000.
Lantaires, Jacques: *See*—
Roche, Georges; and Lantaires, Jacques, 4,530,152, Cl. 29-588.000.
Larew, Eugene T. Salt impregnated fishing lure. 4,530,179, Cl. 43-42.060.
Lark, Russell D.: *See*—
Corley, John E.; Andert, Charles M.; Geen, Joseph H.; Wells, Wesley G.; and Lark, Russell D., 4,530,625, Cl. 408-14.000.
Larson, Glenn F. Electrical sensor for measuring moisture in landscape and agricultural soils. 4,531,087, Cl. 324-65.00P.
Larsson, Jan, to ASEA Aktiebolag. Spot welding gun. 4,531,041, Cl. 219-90.000.
Lash, Edward G.: *See*—
Granzow, Carl F.; Lash, Edward G.; Gleason, Everett; and Kubiak, Jerome, 4,530,226, Cl. 72-171.000.
Lassallette, Jean L.; Lepere, Guy; and Rotat, Gerard, to Thomson CSF. Device for processing logarithmic signals, and its application to a frequency diversity radar. 4,531,124, Cl. 343-5.0DP.
Lastnik, Abraham L.: *See*—
Barron, Edward R.; and Lastnik, Abraham L., 4,530,111, Cl. 2-2.500.
Latham, Ronald D. Variable camber air-foil for a vessel. 4,530,301, Cl. 114-102.000.
Laufer, Helmut, to Robert Bosch GmbH. Fuel injection pump. 4,530,337, Cl. 123-506.000.
Laurent, Harold J.: *See*—
Harvey, Bruce J.; Laurent, Harold J.; and Pauwels, Michael A., 4,530,332, Cl. 123-481.000.
Lauritzen, Donald R.: *See*—
Adams, Gary V.; Anderson, Scott R.; and Lauritzen, Donald R., 4,530,516, Cl. 280-741.000.
Lauritzen, Nels J., to Johnson & Johnson Products, Inc. Unitary adhesive bandage. 4,530,353, Cl. 128-156.000.
Lauterbach-Dammler, Inge: *See*—
Zollner, Dieter; Lauterbach-Dammler, Inge; Taube, Thomas; Lades, Hans; Liebel, Siegfried; and Bauer, Hanns-Georg, 4,531,219, Cl. 373-101.000.
Lawrence, Harry E., III: *See*—
Gaber, Ira; and Lawrence, Harry E., III, 4,530,539, Cl. 297-174.000.
Lawton, Ernest L.: *See*—
Brodmann, George L.; and Lawton, Ernest L., 4,530,876, Cl. 428-283.000.
Le Bras, Philippe, to Mead Corporation, The. Applicator mechanism and method for fitting sleeves onto articles. 4,530,198, Cl. 53-48.000.
Lechler, Gerhard. Dynamometer device. 4,530,249, Cl. 73-862.540.
Leco Corporation: *See*—
O'Brien, Larry S.; and Strunk, William R., 4,530,660, Cl. 432-32.000.
Lee, Frank X.; Krimsky, Leonard C.; and Van Rietschoten, Henk, to Worldwide Converting Machinery, Inc. Rotary cutoff knife. 4,530,265, Cl. 83-337.000.
Lee, John N. Polychromatic time-integrating optical processor for high-speed ambiguity processing. 4,531,195, Cl. 364-822.000.
Lee, Robert S.: *See*—
Davies, James F.; Hight, Andrew T.; and Lee, Robert S., 4,530,774, Cl. 252-108.000.
Lee, Roy, Jr. Vibration dampening and workpiece guiding rollers for a chuck. 4,530,507, Cl. 279-1.00Q.
Legg, Kenneth D.: *See*—
Czaban, John D.; Cormier, Alan D.; and Legg, Kenneth D., 4,531,088, Cl. 324-71.100.
Lehtinen, Jouko; and Saarinen, Kari, to Lannen Tehtaat Oy. Apparatus for feeding the growing substrate into the cells in a set of growing cells. 4,530,383, Cl. 141-71.000.
Leidecker, Hans-Dieter: *See*—
Weiler, Rolf; Kretzer, Horst; Leidecker, Hans-Dieter; and Gerhardt, Winfried, 4,530,506, Cl. 277-212.0FB.
Leland Stanford Jr. Univ., The Board of Trustees of: *See*—
Shaw, Herbert J.; Chodorow, Marvin; and Stokes, Loren F., 4,530,603, Cl. 356-345.000.
Lemelson, Jerome H.; and Grund, Christian. Television system and method. 4,531,152, Cl. 358-141.000.
Leng, Svay, to Fuji Xerox Co., Ltd. Thermal recording device. 4,531,133, Cl. 346-76.0PH.
Lenz, Robert W.: *See*—
Lundberg, Robert D.; Lenz, Robert W.; and Oster, Bernd, 4,530,987, Cl. 526-240.000.
Leonard, Hamlin. Adjustable-drive-ratio multiple-step belt transmission. 4,530,676, Cl. 474-49.000.
Leong, Christopher, to Buxdel Pty. Limited. Container lid with temperature responsive vents. 4,530,440, Cl. 220-201.000.
Leopold, Edmund A., to Glass Equipment Development, Inc. Spacer frame for an insulating glass panel and method of making the same. 4,530,195, Cl. 52-726.000.
Lepere, Guy: *See*—
Lassallette, Jean L.; Lepere, Guy; and Rotat, Gerard, 4,531,124, Cl. 343-5.0DP.
Lestradet, Denis: *See*—
Gauchet, Yves; Crinquette, Andre ; Martinet, Pascal; and Lestradet, Denis, 4,530,465, Cl. 239-127.000.
Lettner, Horst H.: *See*—
Philipp, Heinrich; Lettner, Horst H.; and Hunke, Friedrich, 4,530,649, Cl. 425-71.000.
Leuchtenberger, Wolfgang; Kula, Maria-Regina; Hummel, Werner; and Schutte, Horst, to Degussa Aktiengelleschaft. L-2-hydroxy-4-methylpentanoic acid-dehydrogenase, process for obtaining it and its use. 4,530,903, Cl. 435-130.000.
Lever Brothers Company: *See*—
Brierley, John M.; and Scott, Melvin, 4,530,775, Cl. 252-128.000.
Davies, James F.; Hight, Andrew T.; and Lee, Robert S., 4,530,774, Cl. 252-108.000.
Lamberti, Vincent; and Gutierrez, Eddie N., 4,530,801, Cl. 260-503.000.
van de Pas, Johannes C.; van Voorst Vader, Frederik; and Toet, Wilhelmina K., 4,530,780, Cl. 252-528.000.
Levine, Michael R. Electronic thermostat with repetitive operation cycle. 4,531,064, Cl. 307-66.000.
Levine, Paul J., to HLF Corporation. Computer security system for a time shared computer accessed over telephone lines. 4,531,023, Cl. 179-2.00R.
Lewallen, Steve F.; Lewis, Billy J.; McIver, James R.; Hoss, Robert E.; and Pierce, Edward W., to Great Lakes Carbon Corporation. Nonconducting oxidation retardant coating composition for carbon and graphite. 4,530,853, Cl. 427-113.000.
Lewarchik, Ronald J.; Noren, Gerry K.; Metcalfe, Ronald; Bonin, Demetrius J.; and Poklacki, Erwin S., to DeSoto, Inc. Low temperature-curing polyester urethane systems. 4,530,977, Cl. 525-443.000.
Lewis, Billy J.: *See*—
Lewallen, Steve F.; Lewis, Billy J.; McIver, James R.; Hoss, Robert E.; and Pierce, Edward W., 4,530,853, Cl. 427-113.000.
Lewis, Danny H.: *See*—
Tice, Thomas R.; Lewis, Danny H.; Cowsar, Donald R.; and Beck, Lee R., 4,530,840, Cl. 514-179.000.
Lewis, Henry G., Jr., to RCA Corporation. Digital variable group delay equalizer for a digital television receiver. 4,531,149, Cl. 358-31.000.
Lewis, John C., to Park-Ohio Industries, Inc. Apparatus and method for inductively hardening small bores. 4,531,036, Cl. 219-10.430.
Ley, David A.; and Cady, Susan M., to American Cyanamid Co. Low temperature cure, activated ester coating composition with improved pot life. 4,530,960, Cl. 524-555.000.

Liebel, Siegfried: *See—*
Zollner, Dieter; Lauterbach-Dammler, Inge; Taube, Thomas; Lades, Hans; Liebel, Siegfried; and Bauer, Hanns-Georg, 4,531,219, Cl. 373-101.000.

Liedek, Egon: *See—*
Ostertag, Werner; Dimroth, Peter; Wienand, Henning; Liedek, Egon; Knittel, Helmut; and Etzrodt, Gunter, 4,530,725, Cl. 106-298.000.

Liesegang, Terrence R., to Sperry Corporation. Servomotor control with improved torque limiting. 4,531,081, Cl. 318-632.000.

Lillibridge, Harold R.; and Sullivan, John, to Champion International Corporation. Radio frequency dielectric heater. 4,531,038, Cl. 219-10.810.

Lilly Company, The: *See—*
Nelson, Ronald S.; and Loflin, John D., 4,530,778, Cl. 252-500.000.

Lin, Samuel S., to United States of America, Navy. Real-time Fourier transformer using one acousto-optical cell. 4,531,196, Cl. 364-827.000.

Lin, Samuel S., to United States of America, Navy. Real-time Fourier transformer using one acousto-optical cell. 4,531,197, Cl. 364-827.000.

Lindblom, Ragnvald E.: *See—*
Andersson, Bror A. E.; and Lindblom, Ragnvald E., 4,530,662, Cl. 433-37.000.

Linde Aktiengesellschaft: *See—*
Heisel, Michael; and Ranke, Gerhard, 4,530,827, Cl. 423-575.000.

Lindner, Erno: *See—*
Toke, Laszlo ; Agai, Bela; Bitter, Istvan; Pungor, Erno; Szepesvary nee Toth, Klara; Lindner, Erno; Horvath, Maria; and Havas, Jeno, 4,531,007, Cl. 549-351.000.

Lindner, Georg H., to M&T Chemicals Inc. Glass container hot end coating formulation and method of use. 4,530,857, Cl. 427-314.000.

Linstromberg, William J.: *See—*
Janke, Donald E.; and Linstromberg, William J., 4,530,218, Cl. 62-156.000.

Linton, Derek; and Linton, Pam M., to Linton Systems Limited. Bracket. 4,530,194, Cl. 52-712.000.

Linton, Pam M.: *See—*
Linton, Derek; and Linton, Pam M., 4,530,194, Cl. 52-712.000.

Linton Systems Limited: *See—*
Linton, Derek; and Linton, Pam M., 4,530,194, Cl. 52-712.000.

Littenberg, Joseph S.: *See—*
Vogel, William M., Jr.; Weingardt, Rolf E.; O'Guin, Waco J.; and Littenberg, Joseph S., 4,530,442, Cl. 220-354.000.

Litton Systems, Inc.: *See—*
Schaeffer, Gregory T., 4,531,104, Cl. 331-90.000.

Lockheed Corporation: *See—*
Cronin, Michael J., 4,530,271, Cl. 91-509.000.

Lodge, Robert H.: *See—*
Phillips, Ian R.; Reynolds, Mervyn F.; and Lodge, Robert H., 4,530,695, Cl. 604-184.000.

Lodi, Oliviero; and Armaroli, Gianni, to SASIB S.p.A. Method and device for the feeding of rod-like articles to the hopper of a handling machine. 4,530,633, Cl. 414-414.000.

Loevinger, Richard P. Heated railway tank car. 4,530,288, Cl. 105-358.000.

Loflin, John D.: *See—*
Nelson, Ronald S.; and Loflin, John D., 4,530,778, Cl. 252-500.000.

Logan, Thomas L., to Rockwell International Corporation. Newspaper fold roller. 4,530,690, Cl. 493-442.000.

Long, Charles A., Jr. Stabilizer for manual video game controller. 4,530,504, Cl. 273-148.00B.

Lopez, Marco A., to Northrop Corporation. Variable attenuator for optical transceiver. 4,530,600, Cl. 356-5.000.

Lord Corporation: *See—*
Bucksbee, James H.; and Campany, Andrew D., 4,530,491, Cl. 267-141.000.

Loughridge, Frederick A.: *See—*
Dullea, Leonard V.; Loughridge, Frederick A.; and Johnson, Stephen G., 4,530,710, Cl. 65-56.000.

Louis N. Graves Company, Inc.: *See—*
Graves, Louis N., 4,530,188, Cl. 51-214.000.

Love, Leonard S. Anaerobic reactor. 4,530,762, Cl. 210-603.000.

Lovell, William F.: *See—*
Balyasny, Marik; and Lovell, William F., 4,530,452, Cl. 225-96.000.

Low, Miklos: *See—*
Machovich, Raymund; Nagy, Miklos; Gyorgyi nee Edelenyi, Judit; Horvath, Istvan; Low, Miklos; Csomor, Katalin; Karpati, Egon; Szporny, Laszlo ; and Kisfaludy, Lajos, 4,530,964, Cl. 525-61.000.

Lozano, Albert S.: *See—*
Kusenberger, Felix N.; Lozano, Albert S.; and Tarver, Wilson B., Jr., 4,531,091, Cl. 324-242.000.

Lucas Industries: *See—*
Hill, William F., 4,531,090, Cl. 324-208.000.

Ludington, Charlotte E.: *See—*
Shepherd, Freeman D., Jr.; Pellegrini, Paul W.; Ludington, Charlotte E.; and Weeks, Melanie M., 4,531,055, Cl. 250-211.00J.

Lund, Svend A.; Krarup, Peter; and Kristensen, Thorkild, to Akademiet for de Tekniske Videnskaber, Svejsecentralen. Method for determining the position of a measuring sensor or a probe. 4,530,243, Cl. 73-633.000.

Lundberg, Robert D.; Lenz, Robert W.; and Oster, Bernd, to Exxon Research and Engineering Co. Sulfonated copolymers and process for forming the sulfonated copolymers. 4,530,987, Cl. 526-240.000.

Lundberg, Robert D.: *See—*
Weiss, Robert A.; Lundberg, Robert D.; and Werner, Allen C., 4,530,986, Cl. 526-240.000.

Lurssen, Klaus: *See—*
Kranz, Eckart; Buchel, Karl H.; Kraatz, Udo; Regel, Erik; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Lurssen, Klaus, 4,530,715, Cl. 71-76.000.

Lutticken, Heinrich D.; and Cornelissen, Daniel R. W., to Akzo N.V. Infectious Bursal Disease vaccine. 4,530,831, Cl. 424-89.000.

Lyons, Robert E.; and Walberg, Arvid C. Process and apparatus for filtering spray coating particles from air. 4,530,274, Cl. 98-115.200.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See—*
Fischer, Hermann, 4,530,284, Cl. 101-350.000.
Fischer, Hermann, 4,530,285, Cl. 101-365.000.
Kobler, Ingo; and Petersen, Godber, 4,530,694, Cl. 493-425.000.
Mathes, Josef; Abendroth, Paul; Holl, Roland; and Seikel, Wolfgang, 4,530,283, Cl. 101-230.000.

M.O.S.S. S.r.l.: *See—*
Peterlini, Franco, 4,530,430, Cl. 198-395.000.

M&T Chemicals Inc.: *See—*
Lindner, Georg H., 4,530,857, Cl. 427-314.000.

Machovich, Raymund; Nagy, Miklos; Gyorgyi nee Edelenyi, Judit; Horvath, Istvan; Low, Miklos; Csomor, Katalin; Karpati, Egon; Szporny, Laszlo ; and Kisfaludy, Lajos, to Richter Gedeon Vegyeszeti Gyar R.T. Pharmaceutically active copolymers, process for their preparation and pharmaceutical compositions containing them. 4,530,964, Cl. 525-61.000.

MacInnes, Hugh, to Roto-Master, Inc. Method and apparatus for wastegating turbocharged engine with divided exhaust system. 4,530,640, Cl. 415-144.000.

MacTaggert Scott (Holdings) Ltd.: *See—*
Bird, Robert, 4,530,303, Cl. 114-332.000.

Maebayashi, Jiro: *See—*
Kijima, Takao; Maebayashi, Jiro; and Ando, Fumitaka, 4,530,513, Cl. 280-701.000.

Maeda, Masaya; Takimoto, Hiroyuki; and Kozuki, Susumu, to Canon Kabushiki Kaisha. Camera and separable video recorder/reproducer arrangement. 4,531,164, Cl. 360-33.100.

Maeda, Narimichi: *See—*
Ishizuka, Kohei; Kita, Yasuhiro; Maeda, Narimichi; Koya, Masahiro; Takaoka, Kazuhiko; and Kokuryo, Yoshiro, 4,531,089, Cl. 324-99.00D.

Maekawa, Kouji; and Miyakawa, Nobuhiro, to Mita Industrial Co. Ltd. One-component type red color magnetic developer. 4,530,893, Cl. 430-106.000.

Maerkl, Michael; and Matzner, Joseph, to Siemens Aktiengesellschaft. Disc storage addressing circuit. 4,531,163, Cl. 360-49.000.

Magyar Tudomanyos Akademia: *See—*
Toke, Laszlo ; Agai, Bela; Bitter, Istvan; Pungor, Erno; Szepesvary nee Toth, Klara; Lindner, Erno; Horvath, Maria; and Havas, Jeno, 4,531,007, Cl. 549-351.000.

Mahnke, Harald: *See—*
Woerner, Frank P.; Reimann, Horst; Mahnke, Harald; Neumann, Peter; Turznik, Gerhard; and Kaeppel, Hanshelmut, 4,530,940, Cl. 521-124.000.

Maier, Robert: *See—*
Jacob, Gernot; and Maier, Robert, 4,530,128, Cl. 15-182.000.

Main, Perry A., to APX Group Inc. Method and apparatus for expanding tubular members. 4,530,231, Cl. 72-393.000.

Maisch, Wolfgang; Nusser, Hermann; Peters, Klaus-Jurgen; and Strohl, Willi, to Robert Bosch GmbH. Fuel injection system. 4,530,329, Cl. 123-447.000.

Makishima, Akio; Nagata, Tatsuya; and Shimohira, Takajiro, to National Institute for Researches in Inorganic Materials. Aluminosilicate glass containing Y_2O_3 concentrate and ZrO_2. 4,530,909, Cl. 501-73.000.

Malhotra, Satish C., to Du Pont de Nemours, E. I., and Company. Process for making tetrafluoroethylene fine powder. 4,530,981, Cl. 526-73.000.

Malon, Raymond F.; and Zampini, Anthony, to Monsanto Company. Cross-linked polyarylene oxide membranes. 4,530,703, Cl. 55-16.000.

Mann, Arnold; Ruschek, Gerhard; and Zenker, Reinhard, to VDO Adolf Schindling AG. Device for transmitting the set point of a set point adjuster. 4,530,326, Cl. 123-342.000.

Mannesmann AG: *See—*
Meurer, Hans; and Jordans, Josef, 4,530,225, Cl. 72-52.000.

Manservisi, Renato; and Roffi, Roberto, to SASIB S.p.A. Discarding device for discarding defective cigarette packs. 4,530,199, Cl. 53-53.000.

Mantini, Carl P. Device for securing sliding closures. 4,530,531, Cl. 292-302.000.

Mantymaki, Tarmo K., to Outokumpu Oy. Waste heat boiler construction. 4,530,311, Cl. 122-7.00R.

Mark, Fritz: *See—*
Gloor, Peter; Gschwend, Hans; Mark, Fritz; and Matt, Lukas, 4,530,454, Cl. 227-129.000.

Markle, David A., to Perkin-Elmer Corporation, The. Optical transformer using curved strip waveguides to achieve a nearly unchanged F/number. 4,530,565, Cl. 350-96.100.

Maroszek, Raymond V., to James River - Norwalk, Inc. Folding carrier carton including split cover closure, removable trays and blanks for making same. 4,530,459, Cl. 229-23.00R.

Marshall, David L., to Seragen Diagnostics Inc. Soluble insoluble polymers in enzymeimmunoassay. 4,530,900, Cl. 435-7.000.

Marshall, Donald J. Vehicle car door protection system. 4,530,519, Cl. 280-770.000.

Marshall, Steven: *See—*
Powell, Roger M.; Marshall, Steven; and Waterworth, Philip D., 4,530,202, Cl. 53-426.000.

Martin, Henry; and Fricker, Urs, to Ciba-Geigy Corporation. Oxime ethers, compositions containing them and the use thereof. 4,530,716, Cl. 71-88.000.

Martin, Henry, to Ciba-Geigy Corporation. Compositions, which promote plant growth and protect plants, based on oxime ethers and oxime esters. 4,530,798, Cl. 260-465.00E.

Martinet, Pascal: *See*—
Gauchet, Yves; Crinquette, Andre ; Martinet, Pascal; and Lestradet, Denis, 4,530,465, Cl. 239-127.000.

Maru, Hansraj C.; and Farooque, Mohammad, to Energy Research Corporation. Fuel cell system with electrolyte conservation and/or replenishment. 4,530,887, Cl. 429-16.000.

Maruyama, Toshio: *See*—
Koide, Tsuyoshi; and Maruyama, Toshio, 4,530,187, Cl. 51-165.870.

Marvin Glass & Associates: *See*—
Breslow, Jeffrey D.; Morrison, Howard J.; Ditton, Richard A.; Meyer, Steven M.; and Morrison, Robert S., 4,530,499, Cl. 273-1.0GC.

Marzec, Debra S.: *See*—
Carlin, William W.; and Marzec, Debra S., 4,530,742, Cl. 204-95.000.

Maserjian, Joseph. Laser activated MTOS microwave device. 4,531,143, Cl. 357-23.600.

Mason, Arthur C.; Faitel, William M.; and Haselhuhn, James M., to Lamb Technicon Corp. Workpiece handling apparatus. 4,530,637, Cl. 414-750.000.

Massachusetts General Hospital, The: *See*—
Burnham, Charles A.; Bradshaw, John F., Jr.; Kaufman, David E.; Chesler, David A.; and Brownell, Gordon L., 4,531,058, Cl. 250-363.00S.

Mastuyama, Takashi; and Noda, Kazuo, to Olympus Optical Company Ltd. Original conveying apparatus for copying machine. 4,530,591, Cl. 355-8.000.

Masuda, Sadao: *See*—
Nakazato, Norio; Yoshimatsu, Sachihiro; Nawata, Makoto; and Masuda, Sadao, 4,530,708, Cl. 62-13.000.

Masuda, Shunichi: *See*—
Kasuya, Yukio; Yagasaki, Toshiaki; and Masuda, Shunichi, 4,530,593, Cl. 355-14.00R.

Masuoka, Fujio; and Iizuka, Hisakazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor memory device and method for manufacturing the same. 4,531,203, Cl. 365-218.000.

Mathes, Josef; Abendroth, Paul; Holl, Roland; and Seikel, Wolfgang, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Changeover protection system for perfecting printing machines. 4,530,283, Cl. 101-230.000.

Mathevon, Paul: *See*—
Vere , Bernard; Biryoukoff, Maura; and Mathevon, Paul, 4,530,146, Cl. 29-468.000.

Mathis, Ronald D.: *See*—
Swisher, Gregory M.; and Mathis, Ronald D., 4,530,968, Cl. 525-96.000.

Mathou, Marcel. Rest bed, more specially for young children. 4,530,123, Cl. 5-110.000.

Matousek, Stephen: *See*—
Bork, Carl R., Jr.; Steiss, William C.; Tobbe, William P.; Shuflebarger, Earl D.; Matousek, Stephen; and Gardner, Thomas J., 4,530,373, Cl. 137-516.290.

Matsuda, Toshikazu: *See*—
Jinda, Takuma; Matsuda, Toshikazu; and Sakamoto, Masanori, 4,530,993, Cl. 528-353.000.

Matsuda, Toshiro, to Nissan Motor Company, Limited. Operation mode monitor for microcomputer. 4,531,198, Cl. 364-900.000.

Matsui, Shigekazu: *See*—
Nagarekawa, Osamu; and Matsui, Shigekazu, 4,530,891, Cl. 430-5.000.

Matsumoto, Hideo. Citrus fruit squeezer. 4,530,277, Cl. 99-506.000.

Matsumoto, Mutsumi; and Sugi, Hideki, to Nippon Kayaku Kabushiki Kaisha. Catalyst for use in a methacrylic acid process. 4,530,916, Cl. 502-209.000.

Matsuo, Takashi: *See*—
Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, 4,531,008, Cl. 549-447.000.

Matsushita Electric Industrial Co. Ltd.: *See*—
Hasegawa, Kenichi, 4,531,155, Cl. 358-186.000.
Ogawa, Kazufumi, 4,530,709, Cl. 65-3.120.
Yamamoto, Kazushi; Nagai, Takeshi; Hirai, Nobuyuki; and Mori, Shunichiro, 4,530,464, Cl. 239-102.000.

Matsushita, Souichi: *See*—
Kanda, Mutsumi; Matsushita, Souichi; and Nakanishi, Kiyoshi, 4,530,312, Cl. 123-41.350.

Matsushita, Yoh-ichi; Hasegawa, Etsuo; Eshima, Kiyoshi; and Tsuchida, Eishun, to Taiho Pharmaceutical Co., Ltd. Iron-tetraphenylporphine complex having phosphocholine group. 4,530,794, Cl. 260-245.910.

Matsuura, Mitsuyuki; Kageyama, Yoshiteru; Hagiwara, Akito; and Shimada, Takeo, to Mitsubishi Petrochemical Company Limited. Process for polymerizing ethylene. 4,530,983, Cl. 526-125.000.

Matt, Lukas: *See*—
Gloor, Peter; Gschwend, Hans; Mark, Fritz; and Matt, Lukas, 4,530,454, Cl. 227-129.000.

Mattei, Jean P.; and Coutin, Pierre F., to R. Alkan & Cie. Method of grafting a metal reinforcing member in a structure of composite fibre-resin material. 4,530,147, Cl. 29-525.000.

Matterson, Samuel A., to Intervascular, Inc. Vascular grafts with cross-weave patterns. 4,530,113, Cl. 623-1.000.

Mattner, Otto; Merger, Franz; and Towae, Friedrich, to BASF Aktiengesellschaft. Process for the preparation of isocyanates through the thermal cleavage of urethanes. 4,530,796, Cl. 260-453.00P.

Matzner, Joseph: *See*—
Maerkl, Michael; and Matzner, Joseph, 4,531,163, Cl. 360-49.000.

Maxwell, Joseph A., Jr. Sled. 4,530,509, Cl. 280-22.000.

May, Charles F.: *See*—
Hurt, Henry W.; and May, Charles F., 4,530,174, Cl. 37-8.000.

Mayama, Toshio; and Iwase, Hidehiro, to Toshiba Chemical Products Co., Ltd. Conductive synthetic resin molding material. 4,530,779, Cl. 252-507.000.

Maybaum, Stephen: *See*—
Moore, John R.; and Maybaum, Stephen, 4,530,722, Cl. 106-38.350.

Maykut, Dennis J.: *See*—
Shoup, Thomas E., Maykut, Dennis J.; and Eagar, Thomas W., 4,531,042, Cl. 219-99.000.

Mazda Motor Corporation: *See*—
Kijima, Takao; Maebayashi, Jiro; and Ando, Fumitaka, 4,530,513, Cl. 280-701.000.
Nishimura, Hirofumi, 4,530,333, Cl. 123-489.000.
Wakasa, Akinori, 4,530,323, Cl. 123-41.770.

Mazziotti, Philip J., to Zeller Corporation, The. Internal universal joint seal with multiple lips. 4,530,675, Cl. 464-131.000.

McCabe, Dennis; and Soper, Richard S., to United States of America, Agriculture. Preparation of an entomopathogenic fungal insect control agent. 4,530,834, Cl. 424-93.000.

McCallister, Ronald D., to Motorola, Inc. Low signal-to-noise ratio symbol synchronizer. 4,531,224, Cl. 375-110.000.

McCann, John C., to Cubic Western Data. Bidirectional brush pressure source for magnetic read/write heads. 4,531,171, Cl. 360-130.300.

McCartney, Bernard, to Bernard McCartney Limited. Landfill compactor vehicles. 4,530,620, Cl. 404-121.000.

McClellan, William F., to Pipe Shields, Inc. Insulating pipe support apparatus. 4,530,478, Cl. 248-62.000.

McCormick, Daniel F., to Brunswick Corporation. Marine drive shift linkage. 4,530,667, Cl. 440-75.000.

McCoy, Charles D. Pump jack operated compressor. 4,530,646, Cl. 417-464.000.

McCullough, John B.; and Mortensen, Craig A., to Honeywell Inc. Non-delineated semiconductor detector array for infra-red. 4,531,059, Cl. 250-370.000.

McDade, John A.: *See*—
Shannon, Michael A.; and McDade, John A., 4,530,851, Cl. 427-9.000.

McDevitt, Thomas M., to Owens-Illinois, Inc. Tamper indicating packages. 4,530,438, Cl. 215-252.000.

McDonnell Douglas Corporation: *See*—
Corley, John E.; Andert, Charles M.; Geen, Joseph H.; Wells, Wesley G., and Lark, Russell D., 4,530,625, Cl. 408-14.000.

McEldowney, Carl F.: *See*—
Kaminski, Elton G.; and McEldowney, Carl F., 4,530,631, Cl. 413-12.000.

McGovern, Terrence P.; and Schreck, Carl E., to United States of America, Agriculture. Insect repellents. 4,530,935, Cl. 514-613.000.

McGraw-Edison Company: *See*—
Meyer, William R., 4,530,782, Cl. 252-578.000.

McIver, James R.: *See*—
Lewallen, Steve F.; Lewis, Billy J.; McIver, James R.; Hoss, Robert E.; and Pierce, Edward W., 4,530,853, Cl. 427-113.000.

McKaba, William; and Simpson, Clyde B., to Revlon, Inc. Quaternary ammonium hydroxide hair relaxer composition. 4,530,830, Cl. 424-71.000.

McKee, Donald S.: *See*—
Quinn, Anthony W.; McKee, Donald S.; and Rader, Richard B., 4,530,389, Cl. 160-46.000.

McLawhon, George B.: *See*—
Mosier, John E.; Surjaatmadja, Jim B.; McLawhon, George B.; and Penn, Jack C., 4,531,189, Cl. 364-550.000.

McMillan, William G.: *See*—
Gay, Don D.; and McMillan, William G., 4,530,250, Cl. 73-863.120.

Mead Corporation, The: *See*—
Le Bras, Philippe, 4,530,198, Cl. 53-48.000.
Spamer, William S.; and Beerman, Ronald J., 4,530,548, Cl. 312-45.000.

Mecseki Ercbanyaszati Vallalat: *See*—
Czegledi, Bela; Csovari, Mihaly; Erdelyi, Miklos; Illi, Jozsef; Stocker, Lajos; Szoke, Attila; Szabo nee Mogyorosi, Katalin; Riederauer, Szilard; Urmossy, Miklos; Terenyi, Gyula; and Csurgai, Istvan, 4,530,819, Cl. 423-112.000.

Medeco Security Locks, Inc.: *See*—
Oliver, Roy N., 4,530,223, Cl. 70-417.000.

Mednick, Mel; and Weiss, Karyn, to L.J.N. Toys, Ltd. Toy figure with extending neck. 4,530,671, Cl. 446-320.000.

Meehan, Robert F.; Rose, William H.; and Shaffer, David T., to AMP Incorporated. Electrical connector for integrated circuit package. 4,530,552, Cl. 339-17.0CF.

Mehner, Everett C.: *See*—
Bonebright, Mark E.; and Mehner, Everett C., 4,531,129, Cl. 343-754.000.

Meisel, Thomas C., Jr., to Caterpillar Tractor Co. Endless track coupling apparatus. 4,530,546, Cl. 305-39.000.

Meiske, Larry A.: *See*—
Esneault, Calvin P.; Fuentes, Ricardo, Jr.; and Meiske, Larry A., 4,530,915, Cl. 502-115.000.

Meitl, Harold G.: *See*—
Allen, John J.; and Meitl, Harold G., 4,530,537, Cl. 296-1.00C.
Meito Sangyo Kabushiki Kaisha: *See*—
Higashi, Toshihiko; Kobayashi, Yoshinori; and Iwasaki, Shinjiro, 4,530,906, Cl. 435-223.000.
Melchior, Bernd, to August Hohnholz KG; Imchemie Kunststoff GmbH; and Melchior, Bernd. Process of making articles of foamed polymethyl methacrylate. 4,530,806, Cl. 264-22.000.
Menon, Sathischandran: *See*—
Desjardins, Paul J.; Menon, Sathischandran; Milles, Maano; and Pawel, Hans E., 4,530,367, Cl. 128-777.000.
Mensa, Dean L.; and Moss, Dale C., to United States of America, Navy. Buoyant radar reflector. 4,531,128, Cl. 343-18.00C.
Mercer, Frank B., to P.L.G. Research Limited. Retaining fill in a geotechnical structure. 4,530,622, Cl. 405-258.000.
Merck & Co., Inc.: *See*—
Christensen, Burton G.; and Ratcliffe, Ronald W., 4,530,841, Cl. 514-210.000.
Haslam, John L.; and Pogany, Stefano A., 4,530,928, Cl. 514-254.000.
Monaghan, Richard L.; Goetz, Michael A.; and Chang, Raymond S. L., 4,530,790, Cl. 260-239.30P.
Mrozik, Helmut H., 4,530,921, Cl. 514-30.000.
Merger, Franz: *See*—
Mattner, Otto; Merger, Franz; and Towae, Friedrich, 4,530,796, Cl. 260-453.00P.
Mertz, Jean-Luc, to Gerin, Merlin. Electric circuit breaker with a remote controlled static switch. 4,531,172, Cl. 361-13.000.
Mesenhimer, Lee O., to Power Distribution Inc. Polyphase line voltage regulator. 4,531,085, Cl. 323-214.000.
Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See*—
Doellinger, Rolf; and Schindler, Rudolf, 4,530,733, Cl. 156-441.000.
Messerschmitt-Bolkow-Blohm GmbH: *See*—
Wolf, Dietmar; and Tuscher, Otto, 4,530,740, Cl. 204-9.000.
Messier-Hispano-Bugatti (S.A.): *See*—
Veaux, Jacques; and Turiot, Andre, 4,530,425, Cl. 188-299.000.
Metal Box Public Limited Company: *See*—
Pitman, Kelvin G.; Grime, David A.; and Knight, Malcolm R. M., 4,530,246, Cl. 73-799.000.
Metcalfe, Ronald: *See*—
Lewarchik, Ronald J.; Noren, Gerry K.; Metcalfe, Ronald; Bonin, Demetrius J.; and Poklacki, Erwin S., 4,530,977, Cl. 525-443.000.
Metzger, Dorothy. Therapy aid for treating cystic fibrosis. 4,530,349, Cl. 128-1.00R.
Meurer, Hans; and Jordans, Josef, to Mannesmann AG. Bending skelp or strip into split tubes or pipes. 4,530,225, Cl. 72-52.000.
Meyer, Steven M.: *See*—
Breslow, Jeffrey D.; Morrison, Howard J.; Ditton, Richard A.; Meyer, Steven M.; and Morrison, Robert S., 4,530,499, Cl. 273-1.0GC.
Meyer, William R., to McGraw-Edison Company. Electrical apparatus having an improved liquid dielectric composition. 4,530,782, Cl. 252-578.000.
Meyerhoff, Hans P., to Honeywell Inc. Focusing device for external flashing of getters. 4,530,854, Cl. 427-162.000.
Mezger, Hans, to Harley-Davidson Motor Co., Inc. Cylinder block. 4,530,315, Cl. 123-41.740.
Mezger, Manfred: *See*—
Drews, Ulrich; Mezger, Manfred; Schmidt, Bernhard; Seeger, Karl; Sohner, Gerhard; and Roozenbeek, Herman, 4,531,190, Cl. 364-431.110.
Miale, Joseph N.: *See*—
Chang, Clarence D.; and Miale, Joseph N., 4,530,756, Cl. 208-111.000.
Michel, Ulrich; and Radecker, Josef, to Wacker-Chemie GmbH. Room temperature stable organopolysiloxane compositions. 4,530,989, Cl. 528-15.000.
Micheletti, Donald P., to PPG Industries, Inc. Method and apparatus for soldering by means of an industrial robot. 4,530,456, Cl. 228-102.000.
Middlehurst, Richard J.: *See*—
Velsher, Benne; Hvezda, Jaroslav M.; and Middlehurst, Richard J., 4,530,554, Cl. 339-17.00M.
Milani, Francesco, to Milani Resine S.p.A. Apparatus for sizing extruded plastics sections. 4,530,650, Cl. 425-71.000.
Milani Resine S.p.A.: *See*—
Milani, Francesco, 4,530,650, Cl. 425-71.000.
Miles Laboratories, Inc.: *See*—
Kuhlemann, Bruce N.; Horvath, Kalman; and Wharff, Prentice C., 4,530,697, Cl. 604-263.000.
Miles, Malcolm G.: *See*—
Wilson, James D.; and Miles, Malcolm G., 4,530,789, Cl. 260-239.00R.
Miller, Anton J., to AT&T Bell Laboratories. Method of contouring crystal plates. 4,530,139, Cl. 29-25.350.
Miller, David M., to Owens-Corning Fiberglas Corporation. Preheating particulate material. 4,530,166, Cl. 34-39.000.
Miller, Dye O., to A. J. Antunes & Co. Contact toaster. 4,530,276, Cl. 99-386.000.
Miller, Jack E.: *See*—
Dopyera, Emil E.; and Miller, Jack E., 4,530,526, Cl. 285-261.000.
Miller, Thomas M.; and Schraff, Raymond J., to ELTECH Systems Corporation. Readily repairable and lightweight insulating cover for a heated metal container. 4,530,441, Cl. 220-215.000.
Milles, Maano: *See*—
Desjardins, Paul J.; Menon, Sathischandran; Milles, Maano; and Pawel, Hans E., 4,530,367, Cl. 128-777.000.
Mima, Yujiro: *See*—
Ueda, Hiroshi; and Mima, Yujiro, 4,530,580, Cl. 354-82.000.
Minagawa, Shoichi: *See*—
Okamoto, Takeshi; Minagawa, Shoichi; and Niitsuma, Teruo, 4,531,107, Cl. 333-194.000.
Minakawa, Masaaki: *See*—
Sakata, Mamoru; and Minakawa, Masaaki, 4,530,415, Cl. 180-297.000.
Minke, Lutz: *See*—
Foissner, Herbert; Krautwald, Herbert; and Minke, Lutz, 4,531,019, Cl. 174-163.00F.
Minnesota Diversified Products, Inc.: *See*—
Ochs, Gregory J., 4,530,193, Cl. 52-408.000.
Minnesota Mining and Manufacturing Company: *See*—
Drahnak, Timothy J., 4,530,879, Cl. 428-352.000.
Grunzinger, Raymond E., Jr., 4,530,859, Cl. 427-385.500.
Huffman, William A., 4,530,572, Cl. 350-346.000.
Kinderman, Gerard H.; and Sanders, James F., 4,530,721, Cl. 106-2.000.
Nourse, Gary E.; and Dowdle, Dean M., 4,531,117, Cl. 340-572.000.
Sagawa, Burt K., 4,531,141, Cl. 346-209.000.
Minolta Camera K.K.: *See*—
Okamura, Shigeo; Sato, Yoshihiro; and Takahashi, Kenji, 4,530,140, Cl. 29-110.000.
Minolta Camera Kabushiki Kaisha: *See*—
Yamakawa, Kazuo, 4,530,575, Cl. 350-432.000.
Miranti, Joseph P., Jr., to Dayco Corporation. Belt pulley and method of making the same. 4,530,680, Cl. 474-93.000.
Miranti, Joseph P., Jr., to Dayco Corporation. Method of making an arched endless belt and belt made employing the method. 4,530,684, Cl. 474-264.000.
Mr. Gasket Company: *See*—
Spiegel, Martin A.; and Weld, Greg, 4,530,542, Cl. 301-37.00R.
Misumi, Atsushi; and Hiromoto, Shuji, to NHK Spring Co., Ltd. Fiber-reinforced plastics leaf spring. 4,530,490, Cl. 267-47.000.
Mita Industrial Co., Ltd.: *See*—
Kajita, Hiroshi; Iseki, Masahide; Nakajima, Tadanobu; and Kawamori, Yoshizo, 4,530,598, Cl. 355-75.000.
Kimura, Hiroshi; Hisajima, Masahiko; Shibata, Kiyoshi; Irie, Yoichiro; Morimoto, Kiyoshi; Nagashima, Takashi; Yoshikawa, Yasuhiko; Watashi, Masahiro; Yamamoto, Kiyonori; Yamamoto, Toshihiko; and Yoshinaga, Shinsuke, 4,530,588, Cl. 355-3.0DR.
Maekawa, Kouji; and Miyakawa, Nobuhiro, 4,530,893, Cl. 430-106.000.
Mitsubhish Denki Kabushiki Kaisha: *See*—
Nishimura, Hirofumi, 4,530,333, Cl. 123-489.000.
Mitsubishi Denki K.K.: *See*—
Nawa, Akiyoshi; Kato, Yoshiaki; and Shimizu, Takao, 4,531,040, Cl. 219-74.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Fujikawa, Katsuhiro, 4,530,297, Cl. 112-275.000.
Inagaki, Kouichi, 4,530,815, Cl. 419-8.000.
Ito, Toshio; Futakawa, Akemi; and Nakazaki, Osamu, 4,530,477, Cl. 244-153.00R.
Kasugai, Shouzi; and Sawato, Tatsuya, 4,530,683, Cl. 474-144.000.
Komurasaki, Satoshi, 4,530,328, Cl. 123-425.000.
Mitsubishi Petrochemical Company Limited: *See*—
Matsuura, Mitsuyuki; Kageyama, Yoshiteru; Hagiwara, Akito; and Shimada, Takeo, 4,530,983, Cl. 526-125.000.
Tayama, Toshiyuki; and Tanaka, Ryohei, 4,530,952, Cl. 524-159.000.
Mitsubishi Rayon Co., Ltd.: *See*—
Shindo, Mizuo; Yamamoto, Takashi; Fukunaga, Osamu; and Yamamori, Hisayoshi, 4,530,809, Cl. 264-210.700.
Yoshida, Tomohiko, 4,530,953, Cl. 524-311.000.
Mitsui Kensetsu Kabushiki Kaisha: *See*—
Furuta, Toshio; Kawamoto, Nobuhiko; and Honma, Akira, 4,530,621, Cl. 405-150.000.
Miyabayashi, Yoshiyuki; Koyachi, Hiroshi; and Kurosawa, Yukihiro, to Nissan Motor Company, Limited. Instrument panel structure of automotive vehicle. 4,530,517, Cl. 280-752.000.
Miyakawa, Nobuhiro: *See*—
Maekawa, Kouji; and Miyakawa, Nobuhiro, 4,530,893, Cl. 430-106.000.
Miyake, Takashi: *See*—
Ikemoto, Kazuhito; Terakura, Yukio; and Miyake, Takashi, 4,530,253, Cl. 74-440.000.
Miyamoto, Shoichi: *See*—
Ohashi, Hiroyuki; Miyamoto, Shoichi; and Kurihara, Shigeru, 4,530,826, Cl. 423-376.000.
Miyazaki, Hiroaki: *See*—
Tanaka, Toshiaki; Miyazaki, Hiroaki; Etoh, Yukihiro; Kanesaki, Nobukazu; and Iijima, Akihiro, 4,530,324, Cl. 123-300.000.
Miyazaki, Tatsuo: *See*—
Okano, Masami; Tanaka, Akimasa; Suzuki, Takeshi; Ishida, Akira; and Miyazaki, Tatsuo, 4,531,039, Cl. 219-60.00R.
Mizoguchi, Toshimi: *See*—
Nakayama, Masahito; Iwasaki, Akio; Kimura, Shigeru; Tanabe, Sohei; Mizoguchi, Toshimi; Murakami, Akira; Watanabe, Isamu; Okuchi, Masao; Ito, Hisakatsu; and Mori, Toshihito, 4,530,791, Cl. 260-245.20T.

Mizuguchi, Ryuzo: *See*—
Kanda, Kazunori; Ishii, Keizou; Kida, Katsuaki; Ishikura, Shinichi; and Mizuguchi, Ryuzo, 4,530,946, Cl. 523-418.000.
Mizushina, Masaaki: *See*—
Yamada, Takemi; Satoh, Tamataro; Mizushina, Masaaki; Toyota, Koji; and Okamoto, Hiromi, 4,530,322, Cl. 123-188.0AA.
Mizutani, Toshio: *See*—
Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, 4,531,008, Cl. 549-447.000.
Moberg, William K., to Du Pont de Nemours, E. I., and Company. Fungicidal imidazoles and triazoles containing silicon. 4,530,922, Cl. 514-63.000.
Mobil Oil Corporation: *See*—
Braid, Milton, deceased, 4,530,770, Cl. 252-49.600.
Chang, Clarence D.; and Miale, Joseph N., 4,530,756, Cl. 208-111.000.
Cullick, Alvin S.; and Warner, Bert J., 4,530,234, Cl. 73-53.000.
Hartman, Kathy J.; and Shu, Winston R., 4,530,401, Cl. 166-303.000.
Rankel, Lillian A.; and Shu, Paul, 4,530,757, Cl. 208-251.00R.
Valyocsik, Ernest W., 4,531,012, Cl. 564-295.000.
Mochida, Haruo: *See*—
Moriya, Masaichi; Takaishi, Tatsuyuki; Mochida, Haruo; and Takeda, Yoshimitsu, 4,530,185, Cl. 49-280.000.
Mochizuki, Akihiro: *See*—
Nakano, Takaharu; Mochizuki, Akihiro; Nakazato, Morikuni; and Tsuneno, Tatsuro, 4,530,771, Cl. 252-49.600.
Moggi, Giovanni; Flabbi, Luciano; and Strepparola, Ezio, to Montedison S.p.A. Co-vulcanizable compositions based on fluorelastomers and polymeric compounds with a perfluoroetheric structure. 4,530,969, Cl. 525-180.000.
Moggi, Giovanni: *See*—
Geri, Sergio; Moggi, Giovanni; and Lagana, Carlo, 4,530,971, Cl. 525-199.000.
Mohaupt, Henry H. Device for stimulating a subterranean formation. 4,530,396, Cl. 166-63.000.
Mohn, Heinrich: *See*—
Gutermann, Alfons; Herzog, Heinz; Mohn, Heinrich; and Schulke, Karl A., 4,530,818, Cl. 422-240.000.
Mold-Masters Limited: *See*—
Rose, Thomas J., 4,530,654, Cl. 425-566.000.
Molins Machine Company, Inc.: *See*—
Keeny, Thomas R.; and Harris, William W., Jr., 4,530,687, Cl. 493-361.000.
Moll, Philipp: *See*—
Pollmeier, Konrad; and Moll, Philipp, 4,530,294, Cl. 112-63.000.
Momose, Katsumi: *See*—
Okutsu, Kazuhisa; Momose, Katsumi; and Hiraga, Ryozo, 4,530,604, Cl. 356-401.000.
Monaghan, Richard L.; Goetz, Michael A.; and Chang, Raymond S. L., to Merck & Co., Inc. Cholecystokinin antagonists. 4,530,790, Cl. 260-239.30P.
Monks, Frank E., to Aluminum Company of America. Foil rolling method and apparatus. 4,530,230, Cl. 72-363.000.
Monsanto Company: *See*—
Malon, Raymond F.; and Zampini, Anthony, 4,530,703, Cl. 55-16.000.
Wilson, James D.; and Miles, Malcolm G., 4,530,789, Cl. 260-239.00R.
Monser, George J., to Raytheon Company. Ridged waveguide antenna with concave-shaped sidewalls. 4,531,131, Cl. 343-786.000.
Montedison S.p.A.: *See*—
Geri, Sergio; Moggi, Giovanni; and Lagana, Carlo, 4,530,971, Cl. 525-199.000.
Moggi, Giovanni; Flabbi, Luciano; and Strepparola, Ezio, 4,530,969, Cl. 525-180.000.
Montegari, Frank A.: *See*—
Banker, Dennis C.; Montegari, Frank A.; and Norsworthy, John P., 4,531,067, Cl. 307-454.000.
Montiel, Alexandra. Fingernail refinishing product and method. 4,530,726, Cl. 134-6.000.
Moore, Charles H.: *See*—
Cavitt, Michael B.; and Moore, Charles H., 4,530,948, Cl. 523-454.000.
Moore, John R.; and Maybaum, Stephen, to Harborchem, Inc. Binder and refractory compositions and methods. 4,530,722, Cl. 106-38.350.
Moore, Sidney D. Microcomputer-controlled optical apparatus for surveying, rangefinding and trajectory-compensating functions. 4,531,052, Cl. 235-404.000.
Moore, Victor S.: *See*—
Kraft, Wayne R.; Moore, Victor S.; Stahl, William L., Jr.; and Thoma, Nandor G., 4,531,068, Cl. 307-473.000.
Moran, William; and Bellerive, Donald E. Exercising device. 4,530,497, Cl. 272-71.000.
Morel, Don L.: *See*—
Wong, Boon; Morel, Don L.; and Grosvenor, Victor L., 4,531,015, Cl. 136-258.000.
Mori, Koichi: *See*—
Morimoto, Isao; Nakao, Masafumi; and Mori, Koichi, 4,531,183, Cl. 346-135.100.
Mori, Shunichiro: *See*—
Yamamoto, Kazushi; Nagai, Takeshi; Hirai, Nobuyuki; and Mori, Shunichiro, 4,530,464, Cl. 239-102.000.
Mori, Toshihito: *See*—
Nakayama, Masahito; Iwasaki, Akio; Kimura, Shigeru; Tanabe, Sohei; Mizoguchi, Toshimi; Murakami, Akira; Watanabe, Isamu; Okuchi, Masao; Ito, Hisakatsu; and Mori, Toshihito, 4,530,791, Cl. 260-245.20T.
Morimoto, Isao; Nakao, Masafumi; and Mori, Koichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Information recording material. 4,531,183, Cl. 346-135.100.
Morimoto, Kiyoshi: *See*—
Kimura, Hiroshi; Hisajima, Masahiko; Shibata, Kiyoshi; Irie, Yoichiro; Morimoto, Kiyoshi; Nagashima, Takashi; Yoshikawa, Yasuhiko; Watashi, Masahiro; Yamamoto, Kiyonori; Yamamoto, Toshihiko; and Yoshinaga, Shinsuke, 4,530,588, Cl. 355-3.0DR.
Morino, Masuaki; Fujikawa, Yoshiyuki; Haneda, Isamu; and Myoi, Tetsuo, to Sharp Kabushiki Kaisha. Tape recorder drive system in a programmable electronic calculator. 4,531,194, Cl. 364-705.000.
Morita, Hideo: *See*—
Shiraki, Toshinori; Yamori, Akio; and Morita, Hideo, 4,530,966, Cl. 525-89.000.
Shiraki, Toshinori; Yamori, Akio; and Morita, Hideo, 4,530,967, Cl. 525-89.000.
Morita, Shigeru: *See*—
Tatemoto, Masayoshi; Furukawa, Yasuyoshi; Tomoda, Masayasu; Oka, Masahiko; and Morita, Shigeru, 4,530,972, Cl. 525-276.000.
Moriya, Masaichi; Takaishi, Tatsuyuki; Mochida, Haruo; and Takeda, Yoshimitsu, to Ohi Seisakusho Co., Ltd.; and Nissan Motor Co., Ltd. Automatic door opening and closing device. 4,530,185, Cl. 49-280.000.
Moroishi, Taishi; Fujikawa, Hisao; Murayama, Junichiro; and Shoji, Yuji, to Sumitomo Metal Industries, Ltd.; and Nippon Stainless Steel Co., Ltd. High temperature oxidation resistant austenitic steel. 4,530,720, Cl. 75-128.00A.
Morozumi, Mitsuharu; Ito, Yasumichi; Hiramatsu, Takeshi; and Asai, Minoru, to Asahi Glass Company Ltd. Fluoroelastomer composition and lining material made thereof. 4,530,970, Cl. 525-193.000.
Morrison, Howard J.: *See*—
Breslow, Jeffrey D.; Morrison, Howard J.; Ditton, Richard A.; Meyer, Steven M.; and Morrison, Robert S., 4,530,499, Cl. 273-1.0GC.
Morrison Motor Company: *See*—
Morrison, Ronald D., 4,530,316, Cl. 123-44.00R.
Morrison, Robert S.: *See*—
Breslow, Jeffrey D.; Morrison, Howard J.; Ditton, Richard A.; Meyer, Steven M.; and Morrison, Robert S., 4,530,499, Cl. 273-1.0GC.
Morrison, Ronald D., to Morrison Motor Company. Rotating cylinder internal combustion engine. 4,530,316, Cl. 123-44.00R.
Mortensen, Craig A.: *See*—
McCullough, John B.; and Mortensen, Craig A., 4,531,059, Cl. 250-370.000.
Morton Thiokol Inc.: *See*—
Adams, Gary V.; Anderson, Scott R.; and Lauritzen, Donald R., 4,530,516, Cl. 280-741.000.
Moser, Peter: *See*—
Gruber, Gerhard; Moser, Peter; Conrad, Ulrich; and Vlach, Jiri, 4,530,682, Cl. 474-133.000.
Mosier, John E.; Surjaatmadja, Jim B.; McLawhon, George B.; and Penn, Jack C., to Halliburton Company. Data conversion, communication and analysis system. 4,531,189, Cl. 364-550.000.
Moss, Dale C.: *See*—
Mensa, Dean L.; and Moss, Dale C., 4,531,128, Cl. 343-18.00C.
Moss, Roger E.: *See*—
Moss, Trevor A.; and Moss, Roger E., 4,530,137, Cl. 28-171.000.
Moss, Theron C., to Seco Industries, Inc. Mop swab with screw-on mop head. 4,530,130, Cl. 15-229.00A.
Moss, Trevor A.; and Moss, Roger E. Apparatus for unraveling knitted fabric. 4,530,137, Cl. 28-171.000.
Motorola, Inc.: *See*—
Brusen, Karl R., 4,531,235, Cl. 455-273.000.
McCallister, Ronald D., 4,531,224, Cl. 375-110.000.
Reed, John C., 4,531,098, Cl. 330-53.000.
Yamada, Noriyuki, 4,531,173, Cl. 361-86.000.
Mowill, Rolf J., to A/S Kongsberg Vapenfabrikk. Dual-entry centrifugal compressor. 4,530,639, Cl. 415-98.000.
Mross, Wolf D.; Schwarzmann, Matthias; Plueckham, Juergen; and Dehler, Juergen, to BASF Aktiengesellschaft. Regeneration of the Al_2O_3 carrier material of a spent Ag/Al_2O_3 supported catalysts. 4,530,910, Cl. 502-24.000.
Mrozik, Helmut H., to Merck & Co., Inc. Avermectin epoxide derivatives and method of use. 4,530,921, Cl. 514-30.000.
Muck, Jack E., to AccuSpray, Inc. Supply/shut-off valve. 4,530,469, Cl. 239-569.000.
Mukoyama, Yoshiyuki; Sakata, Touichi; and Osada, Yuichi, to Hitachi Chemical Company, Ltd. Polyamide-imide resin composition. 4,530,975, Cl. 525-423.000.
Muller, Maurice E.; Niederer, Peter G.; and Frey, Otto, to Gebruder Selzer AG; and Protek AG. Shank for a prosthesis. 4,530,115, Cl. 623-23.000.
Muller, Rolf, to Papst-Motoren GmbH & Co. KG. Brushless DC drive motor for signal recording means. 4,531,079, Cl. 318-254.000.
Multi-Tech Corporation: *See*—
Barron, Edward R.; and Lastnik, Abraham L., 4,530,111, Cl. 2-2.500.
Munker, Max: *See*—
Hild, Berthold; Braun, Martin; and Munker, Max, 4,530,224, Cl. 72-15.000.
Munro, Mark S.; Quattrone, Alfred J.; Ellsworth, Steven R.; and Eberhart, Robert C., to Board of Regents, The University of Texas Sys-

tem. Nonthrombogenic articles having enhanced albumin affinity. 4,530,974, Cl. 525-329.400.
Munson, Chester L. Dynamometer having torque and horsepower readout. 4,530,248, Cl. 73-862.170.
Muntel, Bruno. Holder and attachment for lathe tools. 4,530,263, Cl. 82-36.00R.
Murakami, Akira: *See*—
Nakayama, Masahito; Iwasaki, Akio; Kimura, Shigeru; Tanabe, Sohei; Mizoguchi, Toshimi; Murakami, Akira; Watanabe, Isamu; Okuchi, Masao; Ito, Hisakatsu; and Mori, Toshihito, 4,530,791, Cl. 260-245.20T.
Murakami, Toshio; and Hanma, Kentaro, to Hitachi, Ltd. Automatic focusing system for video cameras. 4,531,158, Cl. 358-227.000.
Murakoshi, Makoto, to Fuji Photo Film Co., Ltd. Sound recording system for electronic still camera. 4,531,161, Cl. 360-10.100.
Murata, Taneo, to Alps Electric Co., Ltd. Locking type pushbutton switch. 4,531,032, Cl. 200-153.00J.
Murayama, Junichiro: *See*—
Moroishi, Taishi; Fujikawa, Hisao; Murayama, Junichiro; and Shoji, Yuji, 4,530,720, Cl. 75-128.00A.
Murray, Hallam G.: *See*—
Rawson, Eric G.; Murray, Hallam G.; Schmidt, Ronald V.; and Stewart, Lawrence C., 4,531,238, Cl. 455-601.000.
Musser, John H.; and Sutherland, Charles A., to USV Pharmaceutical Corp. 8-Quinoline carbanilates for the inhibition of lipolysis. 4,530,931, Cl. 514-312.000.
Mutter, Walter E., to International Business Machines Corporation. Method for manufacturing Fresnel phase reversal plate lenses. 4,530,736, Cl. 156-643.000.
Mylander, Richard H., to J. I. Case Company. Park lock and transmission interlock. 4,530,426, Cl. 192-4.00A.
Myoi, Tetsuo: *See*—
Morino, Masuaki; Fujikawa, Yoshiyuki; Haneda, Isamu; and Myoi, Tetsuo, 4,531,194, Cl. 364-705.000.
N.J. Institute of Technology: *See*—
Desjardins, Paul J.; Menon, Sathischandran; Milles, Maano; and Pawel, Hans E., 4,530,367, Cl. 128-777.000.
N.J. Phillips Pty. Limited: *See*—
Phillips, Ian R.; Reynolds, Mervyn F.; and Lodge, Robert H., 4,530,695, Cl. 604-184.000.
Nabeta, Eiichi: *See*—
Yasuhara, Takeshi; and Nabeta, Eiichi, 4,531,193, Cl. 364-551.000.
Nacht, Sergio: *See*—
Smith, Walter P.; and Nacht, Sergio, 4,530,828, Cl. 424-61.000.
Nagai, Takeshi: *See*—
Yamamoto, Kazushi; Nagai, Takeshi; Hirai, Nobuyuki; and Mori, Shunichiro, 4,530,464, Cl. 239-102.000.
Nagano, Masashi, to Shimano Industrial Company Limited. Derailleur for a bicycle. 4,530,677, Cl. 474-80.000.
Nagarekawa, Osamu; and Matsui, Shigekazu, to Hoya Electronics Co., Ltd. Photo-mask blank for use in lithography including a modified chromium compound. 4,530,891, Cl. 430-5.000.
Nagasawa, Hisamichi: *See*—
Terajima, Jiro; Suzuki, Tadahiko; and Nagasawa, Hisamichi, 4,531,026, Cl. 200-5.00R.
Nagashima, Takashi: *See*—
Kimura, Hiroshi; Hisajima, Masahiko; Shibata, Kiyoshi; Irie, Yoichiro; Morimoto, Kiyoshi; Nagashima, Takashi; Yoshikawa, Yasuhiko; Watashi, Masahiro; Yamamoto, Kiyonori; Yamamoto, Toshihiko; and Yoshinaga, Shinsuke, 4,530,588, Cl. 355-3.0DR.
Nagata, Tatsuya: *See*—
Makishima, Akio; Nagata, Tatsuya; and Shimohira, Takajiro, 4,530,909, Cl. 501-73.000.
Nagel, Hartmut: *See*—
Zimmermann, Hans; Pieper, Fritz; and Nagel, Hartmut, 4,530,495, Cl. 271-204.000.
Nagodawithana, Tilak; and Gutmanis, Feliks, to Universal Foods Corporation. Method for the production of selenium yeast. 4,530,846, Cl. 426-62.000.
Nagy, Janos; and Oldal, Endre, to Tungsram Rt. Electrical current inlet particularly for discharge tubes of high pressure discharge light sources. 4,531,074, Cl. 313-331.000.
Nagy, Miklos: *See*—
Machovich, Raymund; Nagy, Miklos; Gyorgyi nee Edelenyi, Judit; Horvath, Istvan; Low, Miklos; Csomor, Katalin; Karpati, Egon; Szporny, Laszlo ; and Kisfaludy, Lajos, 4,530,964, Cl. 525-61.000.
Naito, Youichiro: *See*—
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,530,926, Cl. 514-214.000.
Nakahira, Akitaro, to Hohyu Rubber Co., Ltd. Cushion tire. 4,530,386, Cl. 152-315.000.
Nakajima, Akira: *See*—
Nakayama, Takeshi; Kurosu, Masaaki; Ohshima, Yoshimitsu; Fujikata, Kenji; Uchida, Shigeru; and Nakajima, Akira, 4,531,119, Cl. 340-712.000.
Nakajima, Tadanobu: *See*—
Kajita, Hiroshi; Iseki, Masahide; Nakajima, Tadanobu; and Kawamori, Yoshizo, 4,530,598, Cl. 355-75.000.
Nakane, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Amplifier. 4,531,099, Cl. 330-267.000.
Nakanishi, Kiyoshi: *See*—
Kanda, Mutsumi; Matsushita, Souichi; and Nakanishi, Kiyoshi, 4,530,312, Cl. 123-41.350.
Nakano, Takaharu; Mochizuki, Akihiro; Nakazato, Morikuni; and Tsuneno, Tatsuro, to Karonite Chemical Co., Ltd. Lubricating oil compositions. 4,530,771, Cl. 252-49.600.
Nakao, Masafumi: *See*—
Morimoto, Isao; Nakao, Masafumi; and Mori, Koichi, 4,531,183, Cl. 346-135.100.
Nakata, Shinichi: *See*—
Shiroto, Yoshimi; Nakata, Shinichi; and Hashimoto, Hideki, 4,530,753, Cl. 208-68.000.
Shiroto, Yoshimi; Nakata, Shinichi; and Hashimoto, Hideki, 4,530,754, Cl. 208-68.000.
Nakata, Tetsuya: *See*—
Shimizu, Yasumi; and Nakata, Tetsuya, 4,530,994, Cl. 525-403.000.
Nakatani, Mitsuo: *See*—
Azuma, Kazufumi; Nate, Kazuo; Nakatani, Mitsuo; Yokono, Hitoshi; and Endo, Takeshi, 4,530,746, Cl. 204-159.130.
Nakayama, Koichi; and Tanaka, Yoshito, to Toko, Inc. Current injection type logical operation circuit arrangement including a I^2L circuit device comprising I^2L elements. 4,531,065, Cl. 307-200.00A.
Nakayama, Masahito; Iwasaki, Akio; Kimura, Shigeru; Tanabe, Sohei; Mizoguchi, Toshimi; Murakami, Akira; Watanabe, Isamu; Okuchi, Masao; Ito, Hisakatsu; and Mori, Toshihito, to Kowa Co., Ltd. β-Lactam antibiotics. 4,530,791, Cl. 260-245.20T.
Nakayama, Sumio: *See*—
Hirano, Masahiro; and Nakayama, Sumio, 4,530,489, Cl. 267-34.000.
Nakayama, Takeshi; Kurosu, Masaaki; Ohshima, Yoshimitsu; Fujikata, Kenji; Uchida, Shigeru; and Nakajima, Akira, to Hitachi, Ltd. Method and apparatus for key-inputting Kanji. 4,531,119, Cl. 340-712.000.
Nakazaki, Osamu: *See*—
Ito, Toshio; Futakawa, Akemi; and Nakazaki, Osamu, 4,530,477, Cl. 244-153.00R.
Nakazato, Morikuni: *See*—
Nakano, Takaharu; Mochizuki, Akihiro; Nakazato, Morikuni; and Tsuneno, Tatsuro, 4,530,771, Cl. 252-49.600.
Nakazato, Norio; Yoshimatsu, Sachihiro; Nawata, Makoto; and Masuda, Sadao, to Hitachi, Ltd. Air separation method and apparatus therefor. 4,530,708, Cl. 62-13.000.
Nakazawa, Kiwao: *See*—
Suwa, Kyoichi; Kuramochi, Kazuo; and Nakazawa, Kiwao, 4,531,060, Cl. 250-548.000.
Nalco Chemical Company: *See*—
Koskan, Larry P.; Kugel, Roger W.; and Kekish, George T., 4,530,701, Cl. 44-51.000.
Namba, Yuzuru; and Aoyagi, Kenichi, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Suction system for internal combustion engine. 4,530,325, Cl. 123-308.000.
Nambu, Masao; and Kinoshita, Tatsuo, to Nippon Oil Co., Ltd. Deformable bag for use as cooling medium. 4,530,220, Cl. 62-530.000.
Nandagiri, Arun, to American Cyanamid Co. Aerosol dispensing system. 4,530,450, Cl. 222-402.100.
Nate, Kazuo: *See*—
Azuma, Kazufumi; Nate, Kazuo; Nakatani, Mitsuo; Yokono, Hitoshi; and Endo, Takeshi, 4,530,746, Cl. 204-159.130.
Nath, Prem: *See*—
Hanak, Joseph J.; Nath, Prem; Izu, Masatsugu; and Young, James, 4,530,739, Cl. 204-4.000.
National Can Corporation: *See*—
Snyder, Walter W; and Dettmer, Dennis G., 4,530,228, Cl. 72-349.000.
National Institute for Researches in Inorganic Materials: *See*—
Makishima, Akio; Nagata, Tatsuya; and Shimohira, Takajiro, 4,530,909, Cl. 501-73.000.
Natoli, John: *See*—
Hann, William M.; and Natoli, John, 4,530,766, Cl. 210-701.000.
Natori, Koichi, to Natori Shokai Co., Ltd. Method of manufacturing fish and cheese containing food products. 4,530,847, Cl. 426-274.000.
Natori Shokai Co., Ltd.: *See*—
Natori, Koichi, 4,530,847, Cl. 426-274.000.
Nawa, Akiyoshi; Kato, Yoshiaki; and Shimizu, Takao, to Mitsubishi Denki K.K. Hot wire type arc welding torch and cable. 4,531,040, Cl. 219-74.000.
Nawata, Makoto: *See*—
Nakazato, Norio; Yoshimatsu, Sachihiro; Nawata, Makoto; and Masuda, Sadao, 4,530,708, Cl. 62-13.000.
Naylor, Floyd E.: *See*—
Buck, Ollie G.; and Naylor, Floyd E., 4,530,652, Cl. 428-291.000.
NCR Corporation: *See*—
Wilkinson, Philip J., 4,531,132, Cl. 346-76.0PH.
Nebelung, Hermann H.; and Futterknecht, Fritz, to Emhart Industries, Inc. Take-out mechanism for a glassware forming machine. 4,530,711, Cl. 65-260.000.
NEC Corporation: *See*—
Usui, Takeshi, 4,531,239, Cl. 455-607.000.
Nederman, Bill P. P. Braking device for motor-driven reeling devices. 4,530,474, Cl. 242-84.52R.
Nelle, Guenther, to Dr. Johannes Heidenhain GmbH. Length measuring system. 4,530,157, Cl. 33-125.00R.
Nelson, David A., to Rockwell International Corporation. Variable increment tuning select. 4,531,233, Cl. 455-173.000.
Nelson, Ronald S.; and Loflin, John D., to Lilly Company, The. Conductive coatings. 4,530,778, Cl. 252-500.000.
Nelson, Stephen J., to Upjohn Company, The. N-[(phosphinyl) amino]thio- and N-[(phosphinothioyl)amino]-thio-methylcarbamates. 4,531,006, Cl. 549-7.000.

Nemoto, Nobuo, to Aderans Co., Ltd. Method for producing a wig base. 4,530,810, Cl. 264-222.000.

Nessi, Pierre; and Crausaz, Jacques, to Ares N.V. Amsterdam NL, Swiss Branch. Electronic instrument for the control and treatment of infertility in women. 4,530,366, Cl. 128-736.000.

Neste OY: *See*—
Selin, Johan-Fredrik; Huttunen, Jouko; Turunen, Olli; Fors, Jan; Eklund, Vidar; and Ekman, Kurt, 4,530,999, Cl. 536-30.000.

Nestec S. A.: *See*—
Hirsbrunner, Pierre; and Bertholet, Raymond, 4,530,799, Cl. 260-501.130.
Hirsbrunner, Pierre; and Pavillard, Blaise, 4,531,003, Cl. 544-275.000.

Nestor, John J.; and Vickery, Brian H., to Syntex (U.S.A.) Inc. Nonapeptide and decapeptide analogs of LHRH, useful as LHRH agonist. 4,530,920, Cl. 514-15.000.

Neumann, Fred F.: *See*—
Hayden, Richard; and Neumann, Fred F., 4,530,540, Cl. 297-341.000.

Neumann, Peter: *See*—
Woerner, Frank P.; Reimann, Horst; Mahnke, Harald; Neumann, Peter; Turznik, Gerhard; and Kaeppel, Hanshelmut, 4,530,940, Cl. 521-124.000.

New Horizons Manufacturing Ltd.: *See*—
Zuwala, Stanley M.; and Cass, Lloyd D., 4,530,748, Cl. 204-273.000.

New York University: *See*—
Rosenberg, Martin J., 4,530,784, Cl. 260-112.00R.

Newton, Alan R. Vehicle stabilizer. 4,530,518, Cl. 280-758.000.

NGK Insulators, Ltd.: *See*—
Ishiguro, Fujio, 4,530,751, Cl. 204-424.000.

Nguyen, Van T.; Bellmann, Gunter; and Boussel, Francoise, to Battelle Memorial Institute. Low viscosity stable aqueous dispersion of graft carbon black. 4,530,961, Cl. 524-832.000.

NHK Spring Co., Ltd.: *See*—
Misumi, Atsushi; and Hiromoto, Shuji, 4,530,490, Cl. 267-47.000.

Niazi, Sarfaraz, to Farmacon Research Corporation. Composition and method for inhibiting the absorption of nutritional elements from the upper intestinal tract. 4,530,936, Cl. 514-749.000.

Niederer, Peter G.: *See*—
Muller, Maurice E.; Niederer, Peter G.; and Frey, Otto, 4,530,115, Cl. 623-23.000.

Nielsen, Arnold T.: *See*—
De Fusco, Albert A.; and Nielsen, Arnold T., 4,531,013, Cl. 564-428.000.

Nihei, Ryo: *See*—
Inaba, Hajimu; Sakakibara, Shinsuke; and Nihei, Ryo, 4,530,636, Cl. 414-730.000.

Nihon Den-Netsu Keiki Co., Ltd: *See*—
Kondo, Kenshi, 4,530,458, Cl. 228-180.100.

Nihon Kohden Corporation: *See*—
Harada, Hajime; and Kojima, Takeshi, 4,530,365, Cl. 128-696.000.

Nihon Tokushu Noyaku Seizo K.K.: *See*—
Aya, Masahiro; Yasui, Kazuomi; and Kamochi, Atsumi, 4,530,717, Cl. 71-90.000.

Niitsuma, Teruo: *See*—
Okamoto, Takeshi; Minagawa, Shoichi; and Niitsuma, Teruo, 4,531,107, Cl. 333-194.000.

Nikko Kogyo Kabushiki Kaisha: *See*—
Katsuura, Nobuo; and Furusawa, Takashi, 4,530,615, Cl. 403-16.000.

Nilsson, Claes T.: *See*—
Jakobsen, Kjell M.; and Nilsson, Claes T., 4,530,811, Cl. 264-521.000.

Nippon Electric Co., Ltd.: *See*—
Ishihara, Hiroyuki, 4,531,236, Cl. 455-302.000.
Kouyama, Toshitake, 4,531,147, Cl. 358-13.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Yokoyama, Kenji, 4,531,096, Cl. 330-10.000.

Nippon Kayaku Kabushiki Kaisha: *See*—
Hayami, Hiroshi; Kuroda, Yasuo; Kikuchi, Makoto; and Koshi, Kenji, 4,530,797, Cl. 260-465.00C.
Matsumoto, Mutsumi; and Sugi, Hideki, 4,530,916, Cl. 502-209.000.

Nippon Kogaku K. K.: *See*—
Kato, Kinya, 4,530,578, Cl. 350-526.000.
Ogawa, Hidehiro, 4,530,586, Cl. 354-442.000.
Suwa, Kyoichi; Kuramochi, Kazuo; and Nakazawa, Kiwao, 4,531,060, Cl. 250-548.000.

Nippon Kogaku K.K.: *See*—
Ohkubo, Yuji, 4,530,581, Cl. 354-127.120.

Nippon Kokan Kabushiki Kaisha: *See*—
Yamada, Takemi; Satoh, Tamataro; Mizushina, Masaaki; Toyota, Koji; and Okamoto, Hiromi, 4,530,322, Cl. 123-188.0AA.

Nippon Oil Co., Ltd.: *See*—
Nambu, Masao; and Kinoshita, Tatsuo, 4,530,220, Cl. 62-530.000.

Nippon Paint Co., Ltd.: *See*—
Kanda, Kazunori; Ishii, Keizou; Kida, Katsuaki; Ishikura, Shinichi; and Mizuguchi, Ryuzo, 4,530,946, Cl. 523-418.000.

Nippon Stainless Steel Co., Ltd.: *See*—
Moroishi, Taishi; Fujikawa, Hisao; Murayama, Junichiro; and Shoji, Yuji, 4,530,720, Cl. 75-128.00A.

Nippon Steel Corporation: *See*—
Sugie, Masuo; Kurihara, Koji; Aiba, Yoshiro; Komatsu, Nobiru; Ootuka, Haruo; and Nishikido, Kaoru, 4,530,864, Cl. 428-35.000.

Nippondenso Co., Ltd.: *See*—
Sakurai, Takashi, 4,531,232, Cl. 455-152.000.

Nishibori, Setsuo: *See*—
Taniuchi, Akira; Nishibori, Setsuo; Komori, Hirohito; and Hayashi, Motoshige, 4,530,880, Cl. 428-402.000.

Nishikawa, Tetuo: *See*—
Hara, Hiroshi; Tobioka, Takashi; Yoshino, Takeshi; Nishikawa, Tetuo; and Sekine, Jiro, 4,530,582, Cl. 354-203.000.

Nishikido, Kaoru: *See*—
Sugie, Masuo; Kurihara, Koji; Aiba, Yoshiro; Komatsu, Nobiru; Ootuka, Haruo; and Nishikido, Kaoru, 4,530,864, Cl. 428-35.000.

Nishimura, Hirofumi, to Mazda Motor Corporation; and Mitsubhish Denki Kabushiki Kaisha. Automobile fuel control system. 4,530,333, Cl. 123-489.000.

Nishizawa, Jun-ichi; Suzuki, Sohbe; Tamamushi, Takashige; and Arisawa, Yasuo, to Olympus Optical Company Limited; and Nishizawa, Jun-ichi. Solid state image pickup device. 4,531,156, Cl. 358-213.000.

Nissan Motor Co., Ltd.: *See*—
Baba, Yuko, 4,530,484, Cl. 249-56.000.
Chikaraishi, Takayo; and Itoh, Hiroshi, 4,530,184, Cl. 49-213.000.
Fukino, Masato; Yanai, Tokiyoshi; Yamaguchi, Hirotsugu; and Aoyama, Yutaka, 4,530,414, Cl. 180-142.000.
Ito, Hideo, 4,530,514, Cl. 280-701.000.
Matsuda, Toshiro, 4,531,198, Cl. 364-900.000.
Miyabayashi, Yoshiyuki; Koyachi, Hiroshi; and Kurosawa, Yukihiro, 4,530,517, Cl. 280-752.000.
Moriya, Masaichi; Takaishi, Tatsuyuki; Mochida, Haruo; and Takeda, Yoshimitsu, 4,530,185, Cl. 49-280.000.
Noso, Kazunori; Kishi, Norimasa; and Futami, Toru, 4,531,228, Cl. 381-46.000.
Sumi, Yasuo, 4,530,338, Cl. 123-559.000.
Takagi, Kazumasa; and Yamaguchi, Yasuyuki, 4,531,116, Cl. 340-568.000.
Tanaka, Toshiaki; Miyazaki, Hiroaki; Etoh, Yukihiro; Kanesaki, Nobukazu; and Iijima, Akihiro, 4,530,324, Cl. 123-300.000.

Nisshin Kogyo Kabushiki Kaisha: *See*—
Fukuzawa, Genichiro; and Idesawa, Isao, 4,530,424, Cl. 188-196.00D.

Niswender, Gordon D.: *See*—
Dunbar, Bohn D.; Niswender, Gordon D.; and Hudson, James M., 4,530,786, Cl. 260-112.00B.

Nitsuko Limited: *See*—
Inaba, Hiroshi, 4,531,034, Cl. 200-314.000.

Nittan Valve Co., Ltd.: *See*—
Honda, Shoichi, 4,530,319, Cl. 123-90.460.

Nitto Kogyo K.K.: *See*—
Okamura, Shigeo; Sato, Yoshihiro; and Takahashi, Kenji, 4,530,140, Cl. 29-110.000.

NL Industries, Inc.: *See*—
Hayman, Lawrence A., 4,530,238, Cl. 73-431.000.

Noda, Kazuo: *See*—
Mastuyama, Takashi; and Noda, Kazuo, 4,530,591, Cl. 355-8.000.

Nodet Gougis: *See*—
Gauchet, Yves; Crinquette, Andre ; Martinet, Pascal; and Lestradet, Denis, 4,530,465, Cl. 239-127.000.

Noguchi, Masahiro: *See*—
Enjo, Naonori; Noguchi, Masahiro; and Ide, Satoshi, 4,530,773, Cl. 252-67.000.

Nordstrom, Arnold B., to Ancra Corporation. Side guide for cargo loading system. 4,530,483, Cl. 248-500.000.

Nordstrom, Lennart; and Savstrom, Tommy, to Saab-Scania Aktiebolag. Controller. 4,531,080, Cl. 318-628.000.

Noren, Gerry K.: *See*—
Lewarchik, Ronald J.; Noren, Gerry K.; Metcalfe, Ronald; Bonin, Demetrius J.; and Poklacki, Erwin S., 4,530,977, Cl. 525-443.000.

Norsk Hydro a.s.: *See*—
Henriksen, Norolf, 4,530,820, Cl. 423-219.000.

Norsworthy, John P.: *See*—
Banker, Dennis C.; Montegari, Frank A.; and Norsworthy, John P., 4,531,067, Cl. 307-454.000.

North Star Steel Texas, Inc.: *See*—
Read, Robert D., 4,530,392, Cl. 164-268.000.

Northern Telecom Limited: *See*—
Aujla, Sharanjit S., 4,530,553, Cl. 339-17.0LC.
Hadziomerovic, Faruk, 4,531,211, Cl. 370-102.000.
Hadziomerovic, Faruk, 4,531,212, Cl. 370-102.000.
Shannon, Michael A.; and McDade, John A., 4,530,851, Cl. 427-9.000.
Velsher, Benne; Hvezda, Jaroslav M.; and Middlehurst, Richard J., 4,530,554, Cl. 339-17.00M.

Northrop Corporation: *See*—
Lopez, Marco A., 4,530,600, Cl. 356-5.000.

Northwest Natural Gas Company: *See*—
Haas, Aarne T., 4,530,247, Cl. 73-861.000.

Noschilla, Herbert: *See*—
Fink, Roland· Bartos, Hubert; Noschilla, Herbert; and Klingenstein, Walter, 4,530,391, Cl. 164-155.000.

Noso, Kazunori; Kishi, Norimasa; and Futami, Toru, to Nissan Motor Company, Limited. Speech recognition system for an automotive vehicle. 4,531,228, Cl. 381-46.000.

Nourse, Gary E.; and Dowdle, Dean M., to Minnesota Mining and Manufacturing Company. Variable frequency RF electronic surveillance system. 4,531,117, Cl. 340-572.000.

Nozawa, Takamitsu; Kishi, Takao; and Iizuka, Shigeo, to Yoshino Kogyosho Co. Ltd. Liquid spraying device. 4,530,449, Cl. 222-189.000.

Numata, Shigeaki: *See*—
Komatsu, Tatsuyoshi; Numata, Shigeaki; Hioki, Katsuhiko; and Sumino, Toshihiko, 4,530,745, Cl. 204-130.000.
Nupro Company: *See*—
Bork, Carl R., Jr.; Steiss, William C.; Tobbe, William P.; Shufflebarger, Earl D.; Matousek, Stephen; and Gardner, Thomas J., 4,530,373, Cl. 137-516.290.
Nusser, Hermann: *See*—
Maisch, Wolfgang; Nusser, Hermann; Peters, Klaus-Jurgen; and Strohl, Willi, 4,530,329, Cl. 123-447.000.
Nyffeler, Heinz; and Banholzer, Guido, to Von Roll AG. Electrically weldable socket for joining pipe members. 4,530,521, Cl. 285-21.000.
Nyffeler, Heniz; and Buri, Rudolf, to Von Roll AG. Electrically weldable bushings. 4,530,520, Cl. 285-21.000.
Oak Industries Inc.: *See*—
Bluestein, Leo I.; Crandell, Paul E.; Drake, David A.; Jedynak, Leo; and Simpson, Larry W., 4,531,021, Cl. 178-22.080.
Wechselberger, Anthony J.; Bluestein, Leo I.; Jedynak, Leo; Drake, David A.; and Simpson, Larry W., 4,531,020, Cl. 178-22.080.
Obitz, Daniel, to Synthelabo. Isoindole amidoxime derivatives. 4,530,843, Cl. 514-416.000.
O'Brien, Larry S.; and Strunk, William R., to Leco Corporation. Analytical furnace window assembly. 4,530,660, Cl. 432-32.000.
O'Bryan, Frank L. Modular building structure. 4,530,196, Cl. 52-747.000.
Occidental Research Corporation: *See*—
Thomas, Iran L.; and Lai, Chung J., 4,530,764, Cl. 210-637.000.
Ochs, Gregory J., to Minnesota Diversified Products, Inc. Built-up roof structure and method of preparing roof structure. 4,530,193, Cl. 52-408.000.
Oellerer, Friedrich: *See*—
Theurer, Josef; Folser, Karl; and Oellerer, Friedrich, 4,530,403, Cl. 171-16.000.
Ogawa, Hidehiro, to Nippon Kogaku K. K. Apparatus for the setting of exposure control mode in camera. 4,530,586, Cl. 354-442.000.
Ogawa, Kazufumi, to Matsushita Electric Industrial Co., Ltd. Method for producing optical fiber. 4,530,709, Cl. 65-3.120.
O'Guin, Waco J.: *See*—
Vogel, William M., Jr.; Weingardt, Rolf E.; O'Guin, Waco J.; and Littenberg, Joseph S., 4,530,442, Cl. 220-354.000.
Oguma, Tomio; and Hayakawa, Seiji, to Aisin Seiki Kabushiki Kaisha. Supercharger control apparatus for motor vehicles. 4,530,339, Cl. 123-561.000.
Ogura, Shigetaro: *See*—
Endo, Ichiro; Ogura, Shigetaro; and Ohno, Shigeru, 4,531,138, Cl. 346-140.00R.
Ohashi, Hiroyuki; Miyamoto, Shoichi; and Kurihara, Shigeru, to Asahi Kasei Kogyo Kabushiki Kaisha. Method for recovering and utilizing waste heat. 4,530,826, Cl. 423-376.000.
Ohaus Scale Corporation: *See*—
EerNisse, Errol P., 4,531,073, Cl. 310-370.000.
Ohi Seisakusho Co., Ltd.: *See*—
Moriya, Masaichi; Takaishi, Tatsuyuki; Mochida, Haruo; and Takeda, Yoshimitsu, 4,530,185, Cl. 49-280.000.
Ohira, Kazuhiko: *See*—
Kasari, Akira; Ohira, Kazuhiko; and Inoue, Hiroshi, 4,530,958, Cl. 524-512.000.
Ohki, Nobutaka; Furutachi, Nobuo; and Yoshida, Yoshinobu, to Fuji Photo Film Co., Ltd. Color photographic materials with phenol or naphthol ring compound having sulfoamido group. 4,530,899, Cl. 430-551.000.
Ohkubo, Yuji, to Nippon Kogaku K.K. Information display device for camera. 4,530,581, Cl. 354-127.120.
Ohno, Isao: *See*—
Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, 4,531,008, Cl. 549-447.000.
Ohno, Kouzin, to Takara Co., Ltd. Reconfigurable toy. 4,530,670, Cl. 446-94.000.
Ohno, Nobuo: *See*—
Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, 4,531,008, Cl. 549-447.000.
Ohno, Shigeru: *See*—
Endo, Ichiro; Ogura, Shigetaro; and Ohno, Shigeru, 4,531,138, Cl. 346-140.00R.
Ohshima, Yoshimitsu: *See*—
Nakayama, Takeshi; Kurosu, Masaaki; Ohshima, Yoshimitsu; Fujikata, Kenji; Uchida, Shigeru; and Nakajima, Akira, 4,531,119, Cl. 340-712.000.
Ohta, Tomozo; Tsutsumi, Yoshio; and Sugano, Motoshi, to OKI Electric Industry Co., Ltd. High sensitivity FM signal demodulation system. 4,531,148, Cl. 358-21.00R.
Ohtsuki, Osamu, to Fujitju Limited. Charge coupled device with meander channel and elongated, straight, parallel gate electrode. 4,531,225, Cl. 377-58.000.
Oka, Masahiko: *See*—
Tatemoto, Masayoshi; Furukawa, Yasuyoshi; Tomoda, Masayasu; Oka, Masahiko; and Morita, Shigeru, 4,530,972, Cl. 525-276.000.
Okada, Hozuma, to Sakashita Co., Ltd. Sweat-absorbent textile fabric. 4,530,873, Cl. 428-253.000.
Okada, Yoshiyuki; Inoue, Yoshihiro; and Iwanaga, Koichi, to Takeda Chemical Industries, Ltd. Pyrazol-4-yl phosphites. 4,531,005, Cl. 548-116.000.
Okamoto, Hiromi: *See*—
Yamada, Takemi; Satoh, Tamataro; Mizushina, Masaaki; Toyota, Koji; and Okamoto, Hiromi, 4,530,322, Cl. 123-188.0AA.
Okamoto, Takeshi; Minagawa, Shoichi; and Niitsuma, Teruo, to Clarion Co., Ltd. Acoustic surface wave device. 4,531,107, Cl. 333-194.000.
Okamura, Shigeo; Sato, Yoshihiro; and Takahashi, Kenji, to Minolta Camera K.K.; Nitto Kogyo K.K.; and Hodaka Kogyo K.K. Offset preventive diffusing rollers for fixing rollers for electronic copying machines. 4,530,140, Cl. 29-110.000.
Okano, Masami; Tanaka, Akimasa; Suzuki, Takeshi; Ishida, Akira; and Miyazaki, Tatsuo, to Okano Valve Seizo Kabushiki Kaisha. Automatic valve seat build-up welding apparatus. 4,531,039, Cl. 219-60.00R.
Okano Valve Seizo Kabushiki Kaisha: *See*—
Okano, Masami; Tanaka, Akimasa; Suzuki, Takeshi; Ishida, Akira; and Miyazaki, Tatsuo, 4,531,039, Cl. 219-60.00R.
Okawara, Mikio, to Kabushiki Kaisha Okawara Seisakusho. Gas distributing floor for circulating fluidized-bed dryers or the like. 4,530,169, Cl. 34-57.00E.
OKI Electric Industry Co., Ltd.: *See*—
Ohta, Tomozo; Tsutsumi, Yoshio; and Sugano, Motoshi, 4,531,148, Cl. 358-21.00R.
Okuchi, Masao: *See*—
Nakayama, Masahito; Iwasaki, Akio; Kimura, Shigeru; Tanabe, Sohei; Mizoguchi, Toshimi; Murakami, Akira; Watanabe, Isamu; Okuchi, Masao; Ito, Hisakatsu; and Mori, Toshihito, 4,530,791, Cl. 260-245.20T.
Okuno, Yoshitoshi: *See*—
Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, 4,531,008, Cl. 549-447.000.
Okutsu, Kazuhisa; Momose, Katsumi; and Hiraga, Ryozo, to Canon Kabushiki Kaisha. Method of aligning a mask and a wafer for manufacturing semiconductor circuit elements. 4,530,604, Cl. 356-401.000.
Olah, Nicholas J.: *See*—
Zell, Warren E.; Imel, Charles E.; Saam, Richard D.; Hearst, Peter J.; Olah, Nicholas J.; Bialecki, Adolph; and Biggers, Rececca L., 4,530,131, Cl. 15-321.000.
Oldal, Endre: *See*—
Nagy, Janos; and Oldal, Endre, 4,531,074, Cl. 313-331.000.
Olin Corporation: *See*—
Yarwood, John C.; and Tyler, Derek E., 4,530,394, Cl. 164-467.000.
Oliver, Roy N., to Medeco Security Locks, Inc. Guard for key cylinder. 4,530,223, Cl. 70-417.000.
Olsen, Perry C., to RCA Corporation. Tuning coil structure. 4,531,109, Cl. 336-87.000.
Olympus Optical Co., Ltd.: *See*—
Kimura, Kenji, 4,531,206, Cl. 369-44.000.
Kondo, Isao, 4,530,550, Cl. 315-241.00P.
Mastuyama, Takashi; and Noda, Kazuo, 4,530,591, Cl. 355-8.000.
Nishizawa, Jun-ichi; Suzuki, Sohbe; Tamamushi, Takashige; and Arisawa, Yasuo, 4,531,156, Cl. 358-213.000.
Omark Industries, Inc.: *See*—
Gibson, Duane M.; and Scott, Lewis A., 4,530,258, Cl. 76-25.00A.
Reynolds, Michael J., 4,530,679, Cl. 474-92.000.
Omura, Takashi; Harada, Naoki; and Tezuka, Yasuo, to Sumitomo Chemical Company, Limited. Bisazo blue-black dye having vinylsulfone type fiber-reactive group. 4,530,996, Cl. 534-642.000.
Omure, Yukio: *See*—
Hisamoto, Iwao; and Omure, Yukio, 4,530,776, Cl. 252-153.000.
O'Neill, Michael J., to Perkin-Elmer Corp., The. Baseline control for a differential scanning calorimeter. 4,530,608, Cl. 374-11.000.
Ono, Taizo: *See*—
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,530,926, Cl. 514-214.000.
Ono, Takashi: *See*—
Yoshinada, Hiroshi; Oshima, Hiroshi; and Ono, Takashi, 4,531,082, Cl. 318-663.000.
Onuki, Akio: *See*—
Takei, Shushi; and Onuki, Akio, 4,531,170, Cl. 360-119.000.
Ootuka, Haruo: *See*—
Sugie, Masuo; Kurihara, Koji; Aiba, Yoshiro; Komatsu, Nobiru; Ootuka, Haruo; and Nishikido, Kaoru, 4,530,864, Cl. 428-35.000.
Ordidge, Roger J.; and Gordon, Robert E., to Oxford Research Systems Limited. Methods and apparatus of obtaining NMR spectra. 4,531,094, Cl. 324-309.000.
Oronzio deNora Impianti Elettrochimici S.p.A.: *See*—
deNora, Oronzio, 4,530,743, Cl. 204-98.000.
Ortho Pharmaceutical Corporation: *See*—
Pasquale, Samuel A., 4,530,839, Cl. 514-171.000.
Osada, Yuichi: *See*—
Mukoyama, Yoshiyuki; Sakata, Touichi; and Osada, Yuichi, 4,530,975, Cl. 525-423.000.
Osaka Suda Co Ltd: *See*—
Shimizu, Yasumi; and Nakata, Tetsuya, 4,530,994, Cl. 525-403.000.
Osamu, Ohe: *See*—
Ikushima, Koichi; Tanaka, Hirokazu; Osamu, Ohe; Kino, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Arakawa, Akira; and Imanaka, Hiroshi, 4,530,845, Cl. 514-453.000.
Osawa, Shigeru, to Topy Industries, Limited. Spider hub and a wheel rim assembly. 4,530,387, Cl. 152-410.000.
Oshima, Hiroshi: *See*—
Yoshinada, Hiroshi; Oshima, Hiroshi; and Ono, Takashi, 4,531,082, Cl. 318-663.000.

Oskar Frech GmbH & Co.: *See*—
Fink, Roland; Bartos, Hubert; Noschilla, Herbert; and Klingenstein, Walter, 4,530,391, Cl. 164-155.000.

Oster, Bernd: *See*—
Lundberg, Robert D.; Lenz, Robert W.; and Oster, Bernd, 4,530,987, Cl. 526-240.000.

Ostertag, Werner; Dimroth, Peter; Wienand, Henning; Liedek, Egon; Knittel, Helmut; and Etzrodt, Gunter, to BASF Farben; and Fasern Aktiengesellschaft. Preparation of thermally stable lead chromate pigments. 4,530,725, Cl. 106-298.000.

Ostman, Per H., to Ekono Oy. Method for use in recompression evaporation of a solution. 4,530,737, Cl. 159-47.100.

Ostrem, John S.: *See*—
Crane, Hewitt D.; Ostrem, John S.; and Edberg, Peter K., 4,531,231, Cl. 382-13.000.

Otake, Yoshichi: *See*—
Takubo, Takayuki; and Otake, Yoshichi, 4,531,159, Cl. 358-229.000.

Outokumpu Oy: *See*—
Mantymaki, Tarmo K., 4,530,311, Cl. 122-7.00R.

Ovard, John C. Apparatus for removing droplets entrained in a gas stream. 4,530,707, Cl. 55-440.000.

Overton, Raymond C.; and Cole, Charles F., to Conoco Inc. Liquid level controller. 4,530,372, Cl. 137-392.000.

Owens-Corning Fiberglas Corporation: *See*—
Johnson, Carl A., 4,530,860, Cl. 427-386.000.
Miller, David M., 4,530,166, Cl. 34-39.000.
Williamson, Michael, 4,531,218, Cl. 373-39.000.

Owens-Illinois, Inc.: *See*—
Gray, Thomas W.; and Whitney, Ralph H., 4,530,437, Cl. 215-252.000.
McDevitt, Thomas M., 4,530,438, Cl. 215-252.000.

Oxford Research Systems Limited: *See*—
Ordidge, Roger J.; and Gordon, Robert E., 4,531,094, Cl. 324-309.000.

P.L.G. Research Limited: *See*—
Mercer, Frank B., 4,530,622, Cl. 405-258.000.

Pacault, Adolphe: *See*—
Baron, Francis; Flandrois, Serge; and Pacault, Adolphe, 4,530,888, Cl. 429-206.000.

Paccar Inc.: *See*—
Stephens, Donald L., 4,530,524, Cl. 285-187.000.

Pagdin, Brian C., to Solex (U.K.) Limited. Air flow metering. 4,530,334, Cl. 123-494.000.

Palm, Bengt N. J., to Saab-Scania Aktiebolag. Piston engine having at least one heat-insulated combustion chamber, and parts for said engine. 4,530,341, Cl. 123-669.000.

Paltrow, Robert W.: *See*—
Bradley, William P.; Herman, Michael; and Paltrow, Robert W., 4,530,730, Cl. 156-227.000.

Panick, Karl, to Webasto-Werk W. Baier GmbH & Co. Vaporization burner. 4,530,658, Cl. 431-329.000.

Panzera, Carlino: *See*—
Erickson, Arnold R.; Panzera, Carlino; and Tolokan, Robert P., 4,530,884, Cl. 428-608.000.

Papp, Gyula: *See*—
Rakoczi, Jozsef; Berenyi nee Poldermann, Edit; Fekete, Bela; Szekeres, Laszlo; Papp, Gyula; and Keszthelyi nee Udvary, Eva, 4,530,923, Cl. 514-183.000.

Papst-Motoren GmbH & Co. KG: *See*—
Muller, Rolf, 4,531,079, Cl. 318-254.000.

Park-Ohio Industries, Inc.: *See*—
Lewis, John C., 4,531,036, Cl. 219-10.430.

Parker, Edward: *See*—
Parker, Jeffrey L.; and Parker, Edward, 4,530,395, Cl. 165-16.000.

Parker Electronics, Inc.: *See*—
Parker, Jeffrey L.; and Parker, Edward, 4,530,395, Cl. 165-16.000.

Parker, Jeffrey L.; and Parker, Edward, to Parker Electronics, Inc. Single zone HVAC controlled for operation in multiple zone arrangement. 4,530,395, Cl. 165-16.000.

Parker, John A., to United Kingdom Atomic Energy Authority. Logarithmic amplifiers. 4,531,069, Cl. 307-492.000.

Parlman, Robert M.; and Selman, Charles M. Polymerization using benzenediazonium tetrafluoroborate/titanium tetrahalide-based catalysts. 4,530,982, Cl. 526-115.000.

Parry, John C. Apparatus for application of plastics stretch films. 4,530,473, Cl. 242-55.300.

Parselle, John L. B.: *See*—
Heise, Stanley R.; Blackston, Michael D.; Zekich, Michael B.; and Parselle, John L. B., 4,530,183, Cl. 49-42.000.

Pasar, Inc.: *See*—
Pecukonis, Joseph P., 4,531,101, Cl. 330-302.000.

Pasquale, Samuel A., to Ortho Pharmaceutical Corporation. Triphasic oral contraceptive. 4,530,839, Cl. 514-171.000.

Paster, David: *See*—
Paster, Ernest E.; and Paster, David, 4,530,501, Cl. 273-43.00R.

Paster, Ernest E.; and Paster, David, to Eastern Bowling Equipment Company. Conversion apparatus for bowling pin setting machine. 4,530,501, Cl. 273-43.00R.

Pauwels, Michael A.: *See*—
Harvey, Bruce J.; Laurent, Harold J.; and Pauwels, Michael A., 4,530,332, Cl. 123-481.000.

Pavia, Michael R.: *See*—
Butler, Donald E.; Pavia, Michael R.; and Hershenson, Fred M., 4,530,929, Cl. 514-295.000.

Pavillard, Blaise: *See*—
Hirsbrunner, Pierre; and Pavillard, Blaise, 4,531,003, Cl. 544-275.000.

Pawel, Hans E.: *See*—
Desjardins, Paul J.; Menon, Sathischandran; Milles, Maano; and Pawel, Hans E., 4,530,367, Cl. 128-777.000.

Pawloski, James A.; Williams, Graham; and Pawloski, James A., Jr. Fluid actuated orthopedic tool. 4,530,357, Cl. 128-312.000.

Pawloski, James A., Jr.: *See*—
Pawloski, James A.; Williams, Graham; and Pawloski, James A., Jr., 4,530,357, Cl. 128-312.000.

Pearson, Ernest J., to Chloride Group Public Limited Company. Manufacturing recombination electric storage cells. 4,530,153, Cl. 29-623.100.

Pecukonis, Joseph P., to Pasar, Inc. High-frequency amplifier with enhanced gain from use of the Miller effect capacitance. 4,531,101, Cl. 330-302.000.

Pedain, Josef: *See*—
Halpaap, Reinhard; Pedain, Josef; Thoma, Wilhelm; and Grammel, Jurgen, 4,530,990, Cl. 528-53.000.

Pedersen, Kristen I., to Sofec, Inc. Submerged single point mooring apparatus. 4,530,302, Cl. 114-230.000.

Pedersen, Raymond J., to International Business Machines Corporation. Binary number substitution mechanism in a control store element. 4,531,199, Cl. 364-900.000.

Peffley, Richard D.: *See*—
Turner, Robert B.; Peffley, Richard D.; and Vanderhider, James A., 4,530,941, Cl. 521-176.000.

Pellegrini, Paul W.: *See*—
Shepherd, Freeman D., Jr.; Pellegrini, Paul W.; Ludington, Charlotte E.; and Weeks, Melanie M., 4,531,055, Cl. 250-211.00J.

Pelouze Scale Company: *See*—
Bungener, John H., 4,530,607, Cl. 368-109.000.

Penn, Jack C.: *See*—
Mosier, John E.; Surjaatmadja, Jim B.; McLawhon, George B.; and Penn, Jack C., 4,531,189, Cl. 364-550.000.

Penney, Edison P. Tilting bath with pivotal user seat. 4,530,121, Cl. 4-540.000.

Peplow, Marvin J.: *See*—
Voss, Roy N.; and Peplow, Marvin J., 4,530,472, Cl. 242-55.300.

Perkin-Elmer Corporation, The: *See*—
Engelbrecht, Orest; and Laganza, Joseph L., 4,530,635, Cl. 414-627.000.
Markle, David A., 4,530,565, Cl. 350-96.100.
O'Neill, Michael J., 4,530,608, Cl. 374-11.000.

Perkins, Roger G.; and Trujillo, Stephen M., to FDX Patents Holding Company, N.V. Composite coils for toroidal field coils and method of using same. 4,530,812, Cl. 376-142.000.

Permag Corporation: *See*—
Dreckmann, Harald J., 4,531,035, Cl. 219-8.500.

Pernicano, Vincent S. Transfer having adhesive paste coat. 4,530,872, Cl. 428-200.000.

Perri, Giulio C.; Bianco, Tommaso; and Piccirilli, Beniamino, to Biomedica Foscama Industria Chimico Farmaceutica S.p.A. Method for producing fructose-1,6-diphosphoric acid. 4,530,902, Cl. 435-105.000.

Perry, Thomas J., to GTE Automatic Electric Incorporated. Digital span reframing circuit. 4,531,210, Cl. 370-100.000.

Peschmann, Kristian R., to Imatron Associates. Multiple electron beam target for use in X-ray scanner. 4,531,226, Cl. 378-143.000.

Peterlini, Franco, to M.O.S.S. S.r.l. Device for transferring shaped articles from a first to a second belt by uniform orientation arrangement on the latter. 4,530,430, Cl. 198-395.000.

Peters, Clifford M., to Joy Manufacturing Company. Block valve. 4,530,377, Cl. 137-637.200.

Peters, Hans: *See*—
Von Schwerdtner, Otto; Gossen, Hans; Gunther, Jurgen; and Peters, Hans, 4,530,212, Cl. 60-657.000.

Peters, Klaus-Jurgen: *See*—
Maisch, Wolfgang; Nusser, Hermann; Peters, Klaus-Jurgen; and Strohl, Willi, 4,530,329, Cl. 123-447.000.

Peters, Rainer: *See*—
Beyer, Guenter; Hauptmann, Rudolf; and Peters, Rainer, 4,531,125, Cl. 343-7.900.

Petersen, Godber: *See*—
Kobler, Ingo; and Petersen, Godber, 4,530,694, Cl. 493-425.000.

Peterson, Anders; and Walum, Erik. Perfusion-cultivation of animal cells and equipment therefor. 4,530,907, Cl. 435-240.000.

Petre, Joseph E. Combination boot carrying and drying device. 4,530,168, Cl. 34-106.000.

Pfister, William J.: *See*—
Shirn, George A.; and Pfister, William J., 4,531,177, Cl. 361-433.000.

Pfizer Inc.: *See*—
Belletire, John L., 4,530,919, Cl. 562-467.000.
Weeks, Paul D., 4,530,792, Cl. 260-245.20R.

Philipp, Heinrich; Lettner, Horst H.; and Hunke, Friedrich, to AUTOMATIK Apparate-Machinenbau H. Hench GmbH. Apparatus for feeding of molten strands to a drainage trough. 4,530,649, Cl. 425-71.000.

Phillips, Ian R.; Reynolds, Mervyn F.; and Lodge, Robert H., to N.J. Phillips Pty. Limited. Injector. 4,530,695, Cl. 604-184.000.

Phillips, Jim D., to Economy Forms Corporation. Wall climbing form hoist. 4,530,648, Cl. 425-65.000.

Piccirilli, Beniamino: *See*—
Perri, Giulio C.; Bianco, Tommaso; and Piccirilli, Beniamino, 4,530,902, Cl. 435-105.000.

Pieper, Fritz: *See*—
Zimmermann, Hans; Pieper, Fritz; and Nagel, Hartmut, 4,530,495, Cl. 271-204.000.

Pierce, Edward W.: *See*—
Lewallen, Steve F.; Lewis, Billy J.; McIver, James R.; Hoss, Robert E.; and Pierce, Edward W., 4,530,853, Cl. 427-113.000.

Pifferi, Giorgio: *See*—
Clavenna, Gaetano; Farina, Carlo; Pinza, Mario; and Pifferi, Giorgio, 4,530,934, Cl. 514-548.000.

Pilesi, William D.: *See*—
Wowczuk, Andrew; and Pilesi, William D., 4,530,434, Cl. 209-588.000.

Pinelli, Tazio; and Sebastiano, Francesco, to Societa' Italiana Vetro - SIV - S.p.A. Fixed refractor of asymmetrical profile ideal for concentrating solar energy on a suitable collecting surface. 4,530,576, Cl. 350-452.000.

Pinto, Patrick A.: *See*—
Girijavallabhan, Viyyoor M.; Ganguly, Ashit K.; Pinto, Patrick A.; and Versace, Richard W., 4,530,793, Cl. 260-245.20R.

Pinza, Mario: *See*—
Clavenna, Gaetano; Farina, Carlo; Pinza, Mario; and Pifferi, Giorgio, 4,530,934, Cl. 514-548.000.

Pioli, Maurizio, to International Standard Electric Corporation. Device for generating binary digit pseudo-random sequences. 4,531,022, Cl. 178-22.190.

Pioneer Research, Inc.: *See*—
Berger, James K., 4,531,167, Cl. 360-77.000.

Pipe Shields, Inc.: *See*—
McClellan, William F., 4,530,478, Cl. 248-62.000.

Pirtle, James D.: *See*—
Black, Donald; and Pirtle, James D., 4,531,115, Cl. 340-539.000.

Pitman, Kelvin G.; Grime, David A.; and Knight, Malcolm R. M., to Metal Box Public Limited Company. Method and apparatus for identifying fractured brittle articles. 4,530,246, Cl. 73-799.000.

Pittz, Eugene P.: *See*—
Smerbeck, Richard V.; and Pittz, Eugene P., 4,530,844, Cl. 514-458.000.

PLM Aktiebolag: *See*—
Jakobsen, Kjell M.; and Nilsson, Claes T., 4,530,811, Cl. 264-521.000.

Plueckham, Juergen: *See*—
Mross, Wolf D.; Schwarzmann, Matthias; Plueckham, Juergen; and Dehler, Juergen, 4,530,910, Cl. 502-24.000.

Poe, Lloyd R.; and Henrichs, Bernard W., to Hartwell Corporation. Externally accessible adjuster for flush latches. 4,530,529, Cl. 292-113.000.

Pogany, Stefano A.: *See*—
Haslam, John L.; and Pogany, Stefano A., 4,530,928, Cl. 514-254.000.

Poklacki, Erwin S.: *See*—
Lewarchik, Ronald J.; Noren, Gerry K.; Metcalfe, Ronald; Bonin, Demetrius J.; and Poklacki, Erwin S., 4,530,977, Cl. 525-443.000.

Poland, John M.: *See*—
Tyree, Christopher W.; and Poland, John M., 4,530,561, Cl. 339-134.000.

Polaroid Corporation: *See*—
Canter, Joseph M.; and Shelton, William A., 4,531,078, Cl. 315-151.000.
Spiegal, Arnold, 4,530,898, Cl. 430-403.000.

Policelli, Frederick J., to Hercules Incorporated. Filament wound interlaminate tubular attachment. 4,530,379, Cl. 138-109.000.

Polidor, Jaromir: *See*—
Zverina, Karel; Tluchor, Denek; Szabo, Josef; Polidor, Jaromir; and Kroupa, Petr, 4,531,043, Cl. 219-121.0PP.

Pollmeier, Konrad; and Moll, Philipp, to Durkoppwerke GmbH. Tubular-goods holder for sewing machine. 4,530,294, Cl. 112-63.000.

Polony, Rudolf; Reinert, Gerhard; Holzle, Gerd; Pugin, Andre ; and Vonderwahl, Rodolphe, to Ciba-Geigy Corporation. Phthalocyanine compounds and anti-microbial use. 4,530,924, Cl. 514-191.000.

Pomphrey, Patrick J., Jr., to United States of America, Air Force. Interface alignment system. 4,530,602, Cl. 356-138.000.

Pond, Stephen F.: *See*—
Drews, Reinhold E.; Fisher, Almon P.; Hermanson, Herman A.; and Pond, Stephen F., 4,531,137, Cl. 346-74.400.

Ponyicky, John F. Wall mounted liquid dispenser. 4,530,448, Cl. 222-181.000.

Ponzo, Charles. Crab trap. 4,530,182, Cl. 43-102.000.

Porter, Travis G.: *See*—
Brashears, David F.; and Porter, Travis G., 4,530,657, Cl. 431-188.000.

Portnoy, Leonard L. Denture magnetic retention unit. 4,530,663, Cl. 433-189.000.

Poupon, Andre; and Favard, Jean-Claude, to Schlumberger Technology Corporation. Methods for automatic processing of information obtained by well logging. 4,531,188, Cl. 364-422.000.

Powell, Roger M.; Marshall, Steven; and Waterworth, Philip D., to ACI Australia Limited. Container filling machine and method. 4,530,202, Cl. 53-426.000.

Powell, Roger W.: *See*—
Johnson, Gerald D.; and Powell, Roger W., 4,530,719, Cl. 75-124.000.

Power Distribution Inc.: *See*—
Mesenhimer, Lee O., 4,531,085, Cl. 323-214.000.

Powers, Richard L.; and Arkind, Kenneth D., to Sanders Associates, Inc. Crossed tee-fed slot antenna. 4,531,130, Cl. 343-767.000.

Pownall, Larry D. Releasably lockable articulated handle. 4,530,262, Cl. 81-177.900.

PPG Industries, Inc.: *See*—
Brodmann, George L.; and Lawton, Ernest L., 4,530,876, Cl. 428-283.000.
Carlin, William W.; and Marzec, Debra S., 4,530,742, Cl. 204-95.000.
Christenson, Roger M.; Scriven, Roger L.; Jerabek, Robert D.; Koren, Jeffrey G.; and Johnson, Mark W., 4,530,945, Cl. 523-400.000.
Duffer, Paul F.; Franz, Helmut; and Kelly, Joseph D., 4,530,889, Cl. 428-326.000.
Michelotti, Donald P., 4,530,456, Cl. 228-102.000.

Prasad, Arun; and Day, Grant P., to Jeneric Industries, Inc. Cobalt-chromium alloys. 4,530,664, Cl. 433-207.000.

Pratt, Michael J. Collapsible cup holder. 4,530,480, Cl. 248-311.200.

Prewer, Richard W., to International In-Store Sales Limited. Dispensing arrangement for advertising coupons. 4,530,200, Cl. 53-157.000.

Proctor, Ted G.: *See*—
Weaver, Robert F.; and Proctor, Ted G., 4,531,072, Cl. 310-162.000.

Produits Chimiques Ugine Kuhlmann: *See*—
Dugua, Jacques, 4,530,823, Cl. 423-260.000.

Progress-Electrogerate Mauz & Pfeiffer GmbH & Co.: *See*—
Jacob, Gernot; and Maier, Robert, 4,530,128, Cl. 15-182.000.

Proni Industries, Inc.: *See*—
Proni, Oscar, 4,530,523, Cl. 285-179.000.

Proni, Oscar, to Proni Industries, Inc. Unitary cantilever clamp action fitting with a split end. 4,530,523, Cl. 285-179.000.

Protek AG: *See*—
Muller, Maurice E.; Niederer, Peter G.; and Frey, Otto, 4,530,115, Cl. 623-23.000.

Pugin, Andre : *See*—
Polony, Rudolf; Reinert, Gerhard; Holzle, Gerd; Pugin, Andre ; and Vonderwahl, Rodolphe, 4,530,924, Cl. 514-191.000.

Pullukat, Thomas J.; and Hoff, Raymond E., to Chemplex Company. Polymerization catalyst and method. 4,530,912, Cl. 502-104.000.

Pullukat, Thomas J.; and Hoff, Raymond E., to Chemplex Company. Polymerization catalyst and method. 4,530,913, Cl. 502-104.000.

Pungor, Erno: *See*—
Toke, Laszlo ; Agai, Bela; Bitter, Istvan; Pungor, Erno; Szepesvary nee Toth, Klara; Lindner, Erno; Horvath, Maria; and Havas, Jeno, 4,531,007, Cl. 549-351.000.

Pyrenco, Inc.: *See*—
Fetters, Wayne A.; and Chittick, Donald E., 4,530,702, Cl. 48-209.000.

Quattrone, Alfred J.: *See*—
Munro, Mark S.; Quattrone, Alfred J.; Ellsworth, Steven R.; and Eberhart, Robert C., 4,530,974, Cl. 525-329.400.

Quinn, Anthony W.; McKee, Donald S.; and Rader, Richard B., to Scott & Fetzer Company, The. Retractable awning with improved set-up capability. 4,530,389, Cl. 160-46.000.

R. Alkan & Cie: *See*—
Mattei, Jean P.; and Coutin, Pierre F., 4,530,147, Cl. 29-525.000.

Rabinow, Jacob. Electrically settable escort memory. 4,531,061, Cl. 250-566.000.

Radecker, Josef: *See*—
Michel, Ulrich; and Radecker, Josef, 4,530,989, Cl. 528-15.000.

Rader, Richard B.: *See*—
Quinn, Anthony W.; McKee, Donald S.; and Rader, Richard B., 4,530,389, Cl. 160-46.000.

Radici, Pierino, to Societa Italiana Resine S.T.R. S.p.A.; and Enichimica Secondaria S.p.A. Method of copolymerization in suspension of ethylene with straight-chain alpha-olefins to obtain low-density copolymers. 4,530,980, Cl. 526-73.000.

Rahn, Oskar: *See*—
Flamme, Walter; and Rahn, Oskar, 4,530,148, Cl. 29-568.000.

Raidel, John E. Dual stub axle air spring suspension with high-axle hydraulic lift. 4,530,515, Cl. 280-704.000.

Rainville, Gilles, to Rockwell International Corporation. Thick core sandwich structures and method of fabrication thereof. 4,530,197, Cl. 52-797.000.

Raj Technology, Inc.: *See*—
Sandhu, Jaswinder S., 4,530,242, Cl. 73-625.000.

Rakoczi, Jozsef; Berenyi nee Poldermann, Edit; Fekete, Bela; Szekeres, Laszlo ; Papp, Gyula; and Keszthelyi nee Udvary, Eva, to Egyt Gyogyszervegyeszeti Gyar. N-acetamilide, N-(phenoxy-2-propanol)- and N-(phenylamino-2-propanol)-cyclicamines. 4,530,923, Cl. 514-183.000.

Rampel, Guy, to General Electric Company. Electrode coating composed of copolymers derived from diacetone acrylamide. 4,530,890, Cl. 429-217.000.

Randall, Charles E., to Westinghouse Electric Corp. Door entrance. 4,530,189, Cl. 52-30.000.

Ranke, Gerhard: *See*—
Heisel, Michael; and Ranke, Gerhard, 4,530,827, Cl. 423-575.000.

Rankel, Lillian A.; and Shu, Paul, to Mobil Oil Corporation. Process for upgrading heavy crude oils. 4,530,757, Cl. 208-251.00R.

Raspanti, Guiseppe; Fossati, Norberto; and Ferrari, Attilio, to APITAL Produzioni Industriali S.p.A. Piperidine derivatives and use thereof as stabilizers for polymers. 4,530,950, Cl. 524-100.000.

Ratcliffe, Ronald W.: *See*—
Christensen, Burton G.; and Ratcliffe, Ronald W., 4,530,841, Cl. 514-210.000.

Rau, William G.; and Wojtowicz, Edward A., to Burroughs Corp. Remotely initiated separation latch assembly. 4,530,269, Cl. 89-1.140.
Rauch, Burton S., to Allied Corporation. Coupling arrangement for driving and driven members. 4,530,674, Cl. 464-75.000.
Rauscher, Arthur L. Transparent holder. 4,530,178, Cl. 43-26.000.
Rawson, Eric G.; Murray, Hallam G.; Schmidt, Ronald V.; and Stewart, Lawrence C., to Xerox Corporation. Statistical contention control for star configured communication networks. 4,531,238, Cl. 455-601.000.
Ray, Donald L.: *See*—
Stout, Garry A.; and Ray, Donald L., 4,531,028, Cl. 200-38.00R.
Raymark Industries, Inc.: *See*—
Santoso, Muljadi; and Anderson, John N., 4,530,881, Cl. 428-421.000.
Raytheon Company: *See*—
Monser, George J., 4,531,131, Cl. 343-786.000.
RCA Corporation: *See*—
Jastrzebski, Lubomir L.; Ipri, Alfred C.; and Kokkas, Achilles G., 4,530,149, Cl. 29-571.000.
Kaplan, Gerald S.; and Setzer, Russell G., 4,531,208, Cl. 370-7.000.
Kumar, Mahesh, 4,531,105, Cl. 333-117.000.
Lewis, Henry G., Jr., 4,531,149, Cl. 358-31.000.
Olsen, Perry C., 4,531,109, Cl. 336-87.000.
Samuels, Gerard, 4,530,286, Cl. 101-395.000.
Stone, Robert P., 4,531,075, Cl. 315-3.000.
Wolkstein, Herbert J., 4,530,573, Cl. 350-358.000.
Read, Robert D., to North Star Steel Texas, Inc. Continuous casting mold. 4,530,392, Cl. 164-268.000.
Rear, Ian G. Fluid operated hammer. 4,530,407, Cl. 173-17.000.
Redfield, Lawrence J. Flatscreen. 4,531,122, Cl. 340-781.000.
Redlich, Horst; and Stahlbaum, Heinz, to TELDEC Schallplatten GmbH. Record cutting stylus assembly. 4,531,207, Cl. 369-173.000.
Reed, John C., to Motorola, Inc. Wide dynamic range amplifier with second harmonic signal cancellation. 4,531,098, Cl. 330-53.000.
Rega, Anthony: *See*—
Haduch, Paul R.; and Rega, Anthony, 4,530,568, Cl. 350-96.260.
Regel, Erik: *See*—
Kranz, Eckart; Buchel, Karl H.; Kraatz, Udo; Regel, Erik; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Lurssen, Klaus, 4,530,715, Cl. 71-76.000.
Regev, Yitzhak: *See*—
Sarig, Yoav; Regev, Yitzhak; and Grosz, Friedrich, 4,530,278, Cl. 99-547.000.
Reimann, Horst: *See*—
Woerner, Frank P.; Reimann, Horst; Mahnke, Harald; Neumann, Peter; Turznik, Gerhard; and Kaeppel, Hanshelmut, 4,530,940, Cl. 521-124.000.
Reimer, William A., to GTE Automatic Electric Incorporated. Connector lock arrangement. 4,530,558, Cl. 339-75.00M.
Reimer, William A., to GTE Communication Systems Corporation. Printed wiring board guide. 4,531,175, Cl. 361-399.000.
Reinert, Gerhard: *See*—
Polony, Rudolf; Reinert, Gerhard; Holzle, Gerd; Pugin, Andre ; and Vonderwahl, Rodolphe, 4,530,924, Cl. 514-191.000.
Rejwan, Sasson, to Berkey Photo, Inc. Apparatus for cataloguing photographs and negatives. 4,530,176, Cl. 40-359.000.
Related Energy & Security Systems, Inc.: *See*—
Heise, Stanley R.; Blackston, Michael D.; Zekich, Michael B.; and Parselle, John L. B., 4,530,183, Cl. 49-42.000.
Remote Technology Corp.: *See*—
Walker, Kenneth L.; and Farnstrom, Kenneth A., 4,530,522, Cl. 285-91.000.
Renlund, Gary M.; and Johnson, Curtis A., to General Electric Company. Binder removal from thermoplastically formed SiC article. 4,530,808, Cl. 264-63.000.
Resag, Jorg; and Schmale, Gerhard, to Keiper Recaro GmbH & Co. Back rest for vehicle seats. 4,530,541, Cl. 297-452.000.
Restall, James E., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Nickel or cobalt alloy composite. 4,530,885, Cl. 428-670.000.
Rettke, Wilfried: *See*—
Horman, Richard; and Rettke, Wilfried, 4,530,613, Cl. 400-708.000.
Reuters, Ltd.: *See*—
Wigan, Jack S.; Ure, David G.; and Richards, John M., 4,531,184, Cl. 364-200.000.
Revere Corporation of America: *See*—
Jacobson, Walter E., 4,530,245, Cl. 73-768.000.
Reverter, John A.: *See*—
Wilson, David; and Reverter, John A., 4,530,955, Cl. 524-434.000.
Revlon, Inc.: *See*—
McKaba, William; and Simpson, Clyde B., 4,530,830, Cl. 424-71.000.
Rey, Charles A.: *See*—
Danley, Thomas J.; and Rey, Charles A., 4,531,025, Cl. 179-115.5VC.
Reynolds, Frederick E., Jr., to Electric Terminal Corporation. Connector. 4,530,562, Cl. 339-191.00R.
Reynolds, John Barryman: *See*—
Hurt, Henry W.; and May, Charles F., 4,530,174, Cl. 37-8.000.
Reynolds, Mervyn F.: *See*—
Phillips, Ian R.; Reynolds, Mervyn F.; and Lodge, Robert H., 4,530,695, Cl. 604-184.000.
Reynolds, Michael J., to Omark Industries, Inc. Sprocket with radial clearing means. 4,530,679, Cl. 474-92.000.
Rhone-Poulenc Specialties Chimiques: *See*—
Arpin, Rene , 4,530,954, Cl. 524-387.000.
Rice, Larry Richard: *See*—
Rice, Richard R., 4,530,503, Cl. 273-144.00B.
Rice, Richard R., to Rice, Larry Richard. Lottery selectors. 4,530,503, Cl. 273-144.00B.
Richards, John M.: *See*—
Wigan, Jack S.; Ure, David G.; and Richards, John M., 4,531,184, Cl. 364-200.000.
Richards Manufacturing Co., Inc.: *See*—
Griggs, Calvin, 4,530,355, Cl. 128-92.0BB.
Richards, Randall G., to Drackett Company, The. Passive dispenser. 4,530,118, Cl. 4-228.000.
Richardson-Vicks Inc.: *See*—
Dhabhar, Dadi J.; and Schmidt, Nicholas F., 4,530,942, Cl. 523-118.000.
Smith, Walter P.; and Nacht, Sergio, 4,530,828, Cl. 424-61.000.
Richter Gedeon Vegyeszeti Gyar R.T.: *See*—
Machovich, Raymund; Nagy, Miklos; Gyorgyi nee Edelenyi, Judit; Horvath, Istvan; Low, Miklos; Csomor, Katalin; Karpati, Egon; Szporny, Laszlo ; and Kisfaludy, Lajos, 4,530,964, Cl. 525-61.000.
Rickle, Gregory K., to Dow Chemical Company, The. Low K-factor closed cell phenol-aldehyde foam and process for preparation thereof. 4,530,939, Cl. 521-110.000.
Rickmann, Bernard C., to Square D Company. Draw-out circuit breaker with improved external connectors. 4,531,174, Cl. 361-339.000.
Ricoh Company, Ltd.: *See*—
Kaneko, Nobuo; Takemoto, Takeshi; and Yasuda, Hiroshi, 4,530,280, Cl. 101-93.020.
Ricoh Watch Co., Ltd.: *See*—
Kaneko, Nobuo; Takemoto, Takeshi; and Yasuda, Hiroshi, 4,530,280, Cl. 101-93.020.
Riddle, Harry W., to Baker Oil Tools, Inc. Stop device for well conduit. 4,530,399, Cl. 166-173.000.
Riederauer, Szilard: *See*—
Czegledi, Bela; Csovari, Mihaly; Erdelyi, Miklos; Illi, Jozsef; Stocker, Lajos; Szoke, Attila; Szabo nee Mogyorosi, Katalin; Riederauer, Szilard; Urmossy, Miklos; Terenyi, Gyula; and Csurgai, Istvan, 4,530,819, Cl. 423-112.000.
Ringer, Billy R., Sr., to Crestmont Corporation. Computer paper loading-and-unloading device. 4,530,689, Cl. 493-410.000.
Ritchie, Joseph M.; Chang, Bong H.; and Sosnowski, John, to Exxon Research and Engineering Co. Coking with solvent separation of recycle oil using coker naphtha. 4,530,755, Cl. 208-96.000.
Ritsema, Irving R., to Allied Corporation. Disc brake including tie bar on stationary torque receiving member. 4,530,423, Cl. 188-73.390.
Ritter, Catharine A., to Westinghouse Electric Corp. Method of making a transducer assembly. 4,530,138, Cl. 29-25.350.
RIV-SKF Officine di Villar Perosa, SpA: *See*—
Ferrero, Daniele, 4,530,320, Cl. 123-90.560.
Rivier, Jean E. F.: *See*—
Evans, Ronald M.; Swanson, Larry; Vale, Wylie W., Jr.; Rosenfeld, Michael G.; Amara, Susan G.; Brown, Marvin R.; and Rivier, Jean E. F., 4,530,838, Cl. 514-11.000.
Robbins, Murray: *See*—
Johnson, David W., Jr.; and Robbins, Murray, 4,531,110, Cl. 338-22.00R.
Robert Bosch GmbH: *See*—
Bohm, Martin; Kramer, Manfred; and Schwartz, Reinhard, 4,530,327, Cl. 123-357.000.
Drews, Ulrich; Mezger, Manfred; Schmidt, Bernhard; Seeger, Karl; Sohner, Gerhard; and Roozenbeek, Herman, 4,531,190, Cl. 364-431.110.
Laufer, Helmut, 4,530,337, Cl. 123-506.000.
Maisch, Wolfgang; Nusser, Hermann; Peters, Klaus-Jurgen; and Strohl, Willi, 4,530,329, Cl. 123-447.000.
Schmidt, Lothar; and Goebel, Ulrich, 4,531,111, Cl. 338-195.000.
Roberts, Royce G. Thread cleaning device. 4,530,127, Cl. 15-104.040.
Robertshaw Controls Company: *See*—
Sepso, Roger P., 4,530,216, Cl. 62-89.000.
Robins, Roland K.; and Srivastava, Prem C., to Brigham Young University. 2-β-D-ribofuranosylselenazole-4-carboxamide compounds. 4,531,001, Cl. 536-55.000.
Roche, Georges; and Lantaires, Jacques, to Compagnie Industrielle des Telecommunications CIT-ALCATEL. Method for encapsulating semiconductor components using temporary substrates. 4,530,152, Cl. 29-588.000.
Rock, Erich; and Brunner, Josef, to Julius Blum Gesellschaft m.b.H. Pull-out guide assembly for drawers. 4,530,547, Cl. 308-3.800.
Rockwell International Corporation: *See*—
Logan, Thomas L., 4,530,690, Cl. 493-442.000.
Nelson, David A., 4,531,233, Cl. 455-173.000.
Rainville, Gilles, 4,530,197, Cl. 52-797.000.
Tyler, Glenn A., 4,531,216, Cl. 372-9.000.
Roe, Frank L.: *See*—
Borcenk, Frank; Forsythe, Jeffry A.; and Roe, Frank L., 4,530,611, Cl. 400-175.000.
Roffi, Roberto: *See*—
Manservisi, Renato; and Roffi, Roberto, 4,530,199, Cl. 53-53.000.
Rogic, Milorad M.: *See*—
Kolc, Jaroslav F.; Swerdloff, Michael D.; Rogic, Milorad M.; Hendrickson, Larry L.; and Van Der Puy, Michael, 4,530,714, Cl. 71-28.000.
Rohm and Haas Company: *See*—
Hann, William M.; and Natoli, John, 4,530,766, Cl. 210-701.000.

Rohs, Ulrich: *See*—
Helling, Jurgen; and Rohs, Ulrich, 4,530,257, Cl. 74-796.000.

Rokop Corporation: *See*—
Rokop, Joseph; and Rokop, Nikolaus, 4,530,393, Cl. 164-415.000.

Rokop, Joseph; and Rokop, Nikolaus, to Rokop Corporation. Apparatus for shrouding in a continuous casting machine. 4,530,393, Cl. 164-415.000.

Rokop, Nikolaus: *See*—
Rokop, Joseph; and Rokop, Nikolaus, 4,530,393, Cl. 164-415.000.

Rollwitz, William L.; and King, James D., to Southwest Research Institute. Method and apparatus for coal analysis and flow measurement. 4,531,093, Cl. 324-300.000.

Roozenbeek, Herman: *See*—
Drews, Ulrich; Mezger, Manfred; Schmidt, Bernhard; Seeger, Karl; Sohner, Gerhard; and Roozenbeek, Herman, 4,531,190, Cl. 364-431.110.

Rose, Thomas J., to Mold-Masters Limited. Injection molding peripheral opening core ring gate. 4,530,654, Cl. 425-566.000.

Rose, William H.: *See*—
Gingerich, David J.; Rose, William H.; Rupnik, David W.; and Shaffer, David T., 4,531,030, Cl. 200-68.200.
Meehan, Robert F.; Rose, William H.; and Shaffer, David T., 4,530,552, Cl. 339-17.0CF.

Rosenberg, Martin J., to New York University. Large scale extraction process for contact inhibitory factor. 4,530,784, Cl. 260-112.00R.

Rosenberg, William E., to Columbia Chemical Corporation. Aqueous acid plating bath and brightener composition for producing bright electrodeposits of tin. 4,530,741, Cl. 204-54.00R.

Rosenfeld, Michael G.: *See*—
Evans, Ronald M.; Swanson, Larry; Vale, Wylie W., Jr.; Rosenfeld, Michael G.; Amara, Susan G.; Brown, Marvin R.; and Rivier, Jean E. F., 4,530,838, Cl. 514-11.000.

Ross, Alan. Collapsible wind surfing vessel. 4,530,299, Cl. 114-39.000.

Ross, Julian R. H.: *See*—
Sambrook, Rodney M.; and Ross, Julian R. H., 4,530,918, Cl. 502-303.000.

Rossie, Joseph F.: *See*—
Kintz, Lawrence J., Jr.; and Rossie, Joseph F., 4,531,071, Cl. 310-156.000.

Rosteck, Paul R., Jr.: *See*—
Hershberger, Charles L.; and Rosteck, Paul R., Jr., 4,530,904, Cl. 435-172.300.

Rotat, Gerard: *See*—
Lassallette, Jean L.; Lepere, Guy; and Rotat, Gerard, 4,531,124, Cl. 343-5.0DP.

Roto-Master, Inc.: *See*—
MacInnes, Hugh, 4,530,640, Cl. 415-144.000.

Rounkles, Rodney G.; and Holder, Billy W., to Ethyl Molded Products Company. Spray nozzle. 4,530,466, Cl. 239-327.000.

Roussel Uclaf: *See*—
Clemence, Francois; and Brown, Neil L., 4,530,932, Cl. 514-318.000.

Roux, Marcel H. R. Means for assembling tubular scaffolding elements. 4,530,616, Cl. 403-246.000.

Roy, Claude. Mechanical thermostat having proportional control for a solid fuel-burning stove. 4,530,346, Cl. 126-77.000.

Ruhrgas Aktiengesellschaft: *See*—
Altemark, Detlef; Sommers, Hans; and Weid, Manfred, 4,530,656, Cl. 431-8.000.

Rumage, Donald V.; and Biarnesen, Terry L., to Rumage, Donald V. Combined standing and body support for a person. 4,530,419, Cl. 182-106.000.

Rupnik, David W.: *See*—
Gingerich, David J.; Rose, William H.; Rupnik, David W.; and Shaffer, David T., 4,531,030, Cl. 200-68.200.

Ruschek, Gerhard: *See*—
Mann, Arnold; Ruschek, Gerhard; and Zenker, Reinhard, 4,530,326, Cl. 123-342.000.

Rusnak, Miro, to City of Hope National Medical Center. Valve. 4,530,486, Cl. 251-129.000.

Russo, Neil C.: *See*—
Genna, Salvatore A., 4,530,549, Cl. 312-121.000.

Ruter, Ewald. Framework made of hollow sections. 4,530,614, Cl. 403-7.000.

Ryan, Robert C.; Adams, Charles T.; and Washecheck, Don M., to Shell Oil Company. Hydrodenitrification catalyst. 4,530,911, Cl. 502-74.000.

S. C. Johnson & Son, Inc.: *See*—
Gipp, Mark M., 4,530,781, Cl. 252-546.000.

Saab-Scania Aktiebolag: *See*—
Nordstrom, Lennart; and Savstrom, Tommy, 4,531,080, Cl. 318-628.000.
Palm, Bengt N. J., 4,530,341, Cl. 123-669.000.

Saam, Richard D.: *See*—
Zell, Warren E.; Imel, Charles E.; Saam, Richard D.; Hearst, Peter J.; Olah, Nicholas J.; Bialecki, Adolph; and Biggers, Rececca L., 4,530,131, Cl. 15-321.000.

Saarinen, Kari: *See*—
Lehtinen, Jouko; and Saarinen, Kari, 4,530,383, Cl. 141-71.000.

Sabatasso, Louis: *See*—
Stickle, John S.; and Sabatasso, Louis F., 4,530,275, Cl. 99-353.000.

Sabatasso, Louis F.: *See*—
Stickle, John S.; and Sabatasso, Louis F., 4,530,275, Cl. 99-353.000.

Sabbioni, Cesare, to CIMA S.p.A. Gear cutter. 4,530,626, Cl. 409-10.000.

Sabherwal, Inderjit H., to Ensotech, Inc. Processes using calcined, high surface area, particulate matter, and admixture with other agents. 4,530,765, Cl. 210-663.000.

Sadones, Henri, to Societe d'Etude du Radant. Method and device for analyzing a very high frequency radiation beam of electromagnetic waves. 4,531,126, Cl. 343-17.700.

Safety Intelligence Systems: *See*—
Topol, Peter; and Slater, Michael, 4,531,114, Cl. 340-539.000.

Sagawa, Burt K., to Minnesota Mining and Manufacturing Company. Heat-sensitive composition and imaging sheet incorporating same. 4,531,141, Cl. 346-209.000.

Sagmuller, Joseph, to Westinghouse Electric Corp. Meter register with incremental indicia wheel movement. 4,531,051, Cl. 235-1.00C.

Saito, Toranosuke: *See*—
Suzuki, Toshitake; Arai, Naoto; Aoyagi, Shoji; Saito, Toranosuke; Kitani, Masakatu; and Ishibashi, Takashi, 4,531,140, Cl. 346-209.000.

Saitoh, Kiyonobu; and Fujiwara, Katsuyoshi, to Sharp Kabushiki Kaisha. Auto copy-paper selector. 4,530,494, Cl. 271-9.000.

Sakakibara, Shinsuke: *See*—
Inaba, Hajimu; Sakakibara, Shinsuke; and Nihei, Ryo, 4,530,636, Cl. 414-730.000.

Sakamoto, Masanori: *See*—
Jinda, Takuma; Matsuda, Toshikazu; and Sakamoto, Masanori, 4,530,993, Cl. 528-353.000.

Sakashita Co., Ltd.: *See*—
Okada, Hozuma, 4,530,873, Cl. 428-253.000.

Sakata, Mamoru; and Minakawa, Masaaki, to Honda Giken Kogyo Kabushiki Kaisha. Power transmission device for front-engine front-drive car. 4,530,415, Cl. 180-297.000.

Sakata, Touichi: *See*—
Mukoyama, Yoshiyuki; Sakata, Touichi; and Osada, Yuichi, 4,530,975, Cl. 525-423.000.

Sakow, Lawrence. Toilet bowl mounting bolt assembly. 4,530,629, Cl. 411-147.000.

Sakurai, Takashi, to Nippondenso Co., Ltd. Radio receiver apparatus for vehicle. 4,531,232, Cl. 455-152.000.

Sakuranaka, Toru; and Aoki, Hachiro, to Diesel Kiki Co., Ltd. Distribution type fuel injection pump. 4,530,330, Cl. 123-449.000.

Sala, Alberto: *See*—
Winters, Giorgio; and Sala, Alberto, 4,530,927, Cl. 514-215.000.

Salk Institute for Biological Studies, The: *See*—
Evans, Ronald M.; Swanson, Larry; Vale, Wylie W., Jr.; Rosenfeld, Michael G.; Amara, Susan G.; Brown, Marvin R.; and Rivier, Jean E. F., 4,530,838, Cl. 514-11.000.

Sambrook, Rodney M.; and Ross, Julian R. H., to Dyson Refractories Limited. Catalysts and method of their preparation. 4,530,918, Cl. 502-303.000.

Sambuchi-Boisbluche et Cie: *See*—
Boisbluche, Arsene G., 4,530,191, Cl. 52-309.700.

Samuels, Gerard, to RCA Corporation. Intaglio printing plate for printing serial markings. 4,530,286, Cl. 101-395.000.

Sanders Associates, Inc.: *See*—
Powers, Richard L.; and Arkind, Kenneth D., 4,531,130, Cl. 343-767.000.

Sanders, Donald M.: *See*—
Sanders, Robert C.; and Sanders, Donald M., 4,530,122, Cl. 5-83.000.

Sanders EZ Mobility Systems: *See*—
Sanders, Robert C.; and Sanders, Donald M., 4,530,122, Cl. 5-83.000.

Sanders, James F.: *See*—
Kinderman, Gerard H.; and Sanders, James F., 4,530,721, Cl. 106-2.000.

Sanders, Robert C.; and Sanders, Donald M., to Sanders EZ Mobility Systems. Patient weight reliever apparatus. 4,530,122, Cl. 5-83.000.

Sandhu, Jaswinder S., to Raj Technology, Inc. Movable ultrasonic transducer array. 4,530,242, Cl. 73-625.000.

Sandoz Ltd.: *See*—
Bormann, Gerhard, 4,530,842, Cl. 514-344.000.

Sanko Kaihatsu Kagaku Kenkyusho Corporation: *See*—
Suzuki, Toshitake; Arai, Naoto; Aoyagi, Shoji; Saito, Toranosuke; Kitani, Masakatu; and Ishibashi, Takashi, 4,531,140, Cl. 346-209.000.

Santiam O. Adams: *See*—
Adams, Ronald O., 4,530,369, Cl. 132-84.00B.

Santoso, Muljadi; and Anderson, John N., to Raymark Industries, Inc. Fluoroelastomer-based friction material having improved frictional properties. 4,530,881, Cl. 428-421.000.

Sarges, Heidrun; Kommoss, Klaus; and Schutte, Valentin H., to U.S. Philips Corporation. Long path length mechanism for automatic insertion and ejection of an information carrier. 4,530,252, Cl. 74-388.00R.

Sarig, Yoav; Regev, Yitzhak; and Grosz, Friedrich, to State of Israel-Ministry of Agriculture. Apparatus for separating pomegranate seeds, scanning apparatus and techniques useful in connection therewith and storage and packaging techniques for separated seeds. 4,530,278, Cl. 99-547.000.

SASIB S.p.A.: *See*—
Lodi, Oliviero; and Armaroli, Gianni, 4,530,633, Cl. 414-414.000.
Manservisi, Renato; and Roffi, Roberto, 4,530,199, Cl. 53-53.000.

Sato, Katsutoshi; Itoh, Susumu; and Aoshima, Masaru, to Hitachi, Ltd. Apparatus for transporting materials to be transferred and method of controlling exciting current therefor. 4,530,428, Cl. 193-40.000.

Sato, Shigeki. Fluid circulating system. 4,530,208, Cl. 60-516.000.

Sato, Shunichi, to Junkosha Co., Ltd. Heating wire. 4,531,049, Cl. 219-549.000.
Sato, Yoshihiro: *See—*
Okamura, Shigeo; Sato, Yoshihiro; and Takahashi, Kenji, 4,530,140, Cl. 29-110.000.
Satoh, Tamataro: *See—*
Yamada, Takemi; Satoh, Tamataro; Mizushina, Masaaki; Toyota, Koji; and Okamoto, Hiromi, 4,530,322, Cl. 123-188.0AA.
Saulson, Stanley H.; and Wesner, Walter H., to Cordis Corporation. Temporary bipolar pacing lead. 4,530,368, Cl. 128-784.000.
Savstrom, Tommy: *See—*
Nordstrom, Lennart; and Savstrom, Tommy, 4,531,080, Cl. 318-628.000.
Sawato, Tatsuya: *See—*
Kasugai, Shouzi; and Sawato, Tatsuya, 4,530,683, Cl. 474-144.000.
Sawyer, Edith M.: *See—*
Sawyer, Willard C.; Sawyer, Edith M.; Keef, Sherron M.; and Sawyer, John W., 4,530,700, Cl. 44-1.00E.
Sawyer, John W.: *See—*
Sawyer, Willard C.; Sawyer, Edith M.; Keef, Sherron M.; and Sawyer, John W., 4,530,700, Cl. 44-1.00E.
Sawyer, Willard C.; Sawyer, Edith M.; Keef, Sherron M.; and Sawyer, John W. Method and apparatus for use in preparing biomass particles for fuel and for use as chemical feed stock. 4,530,700, Cl. 44-1.00E.
Sayles, David C., to United States of America, Army. Expanding embedment resin for composite-modified double-base propellants. 4,530,728, Cl. 149-19.600.
Scarinci, Joseph V. Universal balance plate. 4,530,239, Cl. 73-455.000.
Schaefer, Lothar F. Locking latch assembly for mounting an electronic component drawer in a rack. 4,530,530, Cl. 292-256.750.
Schaeffer, Gregory T., to Litton Systems, Inc. Tunable magnetron of the coaxial-vacuum type. 4,531,104, Cl. 331-90.000.
Schaeffer, Hans-Joachim: *See—*
Koch, Klaus; Klaus, Rainer; Syrbius, Gerhard; and Schaeffer, Hans-Joachim, 4,530,761, Cl. 210-407.000.
Schaeflern, Henry: *See—*
Szostak, Jan; and Schaeflern, Henry, 4,530,298, Cl. 112-315.000.
Schal, Wilfried, to Fresenius Aktiengesellschaft. Hemodialysis apparatus with degassing means for the dialysis solution. 4,530,759, Cl. 210-104.000.
Scharf, Udo; and Schlingmann, Merten, to Hoechst Aktiengesellschaft. Process for the purification of microbial protein isolates. 4,530,785, Cl. 260-112.00R.
Schell, Loni: *See—*
Berghaeuser, Gunter; Schell, Loni; and Frass, Werner, 4,530,897, Cl. 430-302.000.
Schering Corporation: *See—*
Girijavallabhan, Viyyoor M.; Ganguly, Ashit K.; Pinto, Patrick A.; and Versace, Richard W., 4,530,793, Cl. 260-245.20R.
Goodnow, Robert A.; Shade, Floyd J.; and Sloboth, Thomas A., 4,530,832, Cl. 424-92.000.
Scheuneman, James H., to Sperry Corporation. Memory through checking system with comparison of data word parity before and after ECC processing. 4,531,213, Cl. 371-3.000.
Schiffer, John H. Tubing disconnect tool. 4,530,142, Cl. 29-237.000.
Schindler, Rudolf: *See—*
Doellinger, Rolf; and Schindler, Rudolf, 4,530,733, Cl. 156-441.000.
Schlatter, Beat; and Schnyder, Eugen, to Sulzer-Escher Wyss Limited. Hydrostatic support member, particularly for rolling mills, and method of using the same. 4,530,227, Cl. 72-241.000.
Schleicher, Oskar H., to Fa. Oskar Schleicher. Shed forming arrangement. 4,530,382, Cl. 139-455.000.
Schlesinger, Allen H.; Hudson, L. Keith; and Fish, William M., to Aluminum Company of America. Dense phase precipitation. 4,530,699, Cl. 23-301.000.
Schlingmann, Merten: *See—*
Scharf, Udo; and Schlingmann, Merten, 4,530,785, Cl. 260-112.00R.
Schluderberg, Donald C., to Babcock & Wilcox Company, The. Apparatus for superheating steam. 4,530,814, Cl. 376-317.000.
Schluep, Rene ; and Eisenring, Hugo, to Griesser AG. Venetian blind suspension member support link construction. 4,530,390, Cl. 160-178.00R.
Schlumberger Technology Corporation: *See—*
Poupon, Andre; and Favard, Jean-Claude, 4,531,188, Cl. 364-422.000.
Vanderschel, David J., 4,531,204, Cl. 367-25.000.
Schmale, Gerhard: *See—*
Resag, Jorg; and Schmale, Gerhard, 4,530,541, Cl. 297-452.000.
Schmid, Eberhard; and Brehler, Robert, to Siemens Aktiengesellschaft. Device for stabilizing the voltage of a single- or multi-phase a-c network. 4,531,086, Cl. 323-222.000.
Schmid, Theobald; Widmaier, Horst; and Wolf, Friedrich, to Hand Widmaier Fabrik Fur Apparate Der Fernmelde-und Feinwerktechnik. Keyboard for initiating switching operations or switching signals associated with respective symbols on the surfaces of the keys. 4,531,033, Cl. 200-314.000.
Schmidt, Bernhard: *See—*
Drews, Ulrich; Mezger, Manfred; Schmidt, Bernhard; Seeger, Karl; Sohner, Gerhard; and Roozenbeek, Herman, 4,531,190, Cl. 364-431.110.
Schmidt, John D. Camera support. 4,530,584, Cl. 354-293.000.
Schmidt, Lothar; and Goebel, Ulrich, to Robert Bosch GmbH. Voltage divider in thin- or thick-film technology. 4,531,111, Cl. 338-195.000.
Schmidt, Nicholas F.: *See—*
Dhabhar, Dadi J.; and Schmidt, Nicholas F., 4,530,942, Cl. 523-118.000.
Schmidt, Ronald V.: *See—*
Rawson, Eric G.; Murray, Hallam G.; Schmidt, Ronald V.; and Stewart, Lawrence C., 4,531,238, Cl. 455-601.000.
Schmidts, Kurt: *See—*
Buerkle, Ottmar; Schmidts, Kurt; Schneider, Alfred; and Schuett, Walter, 4,530,475, Cl. 242-199.000.
Schneider, Alfred: *See—*
Buerkle, Ottmar; Schmidts, Kurt; Schneider, Alfred; and Schuett, Walter, 4,530,475, Cl. 242-199.000.
Schneider, Barry L., to Hollister Incorporated. Access port forming device and method. 4,530,525, Cl. 285-200.000.
Schneider, Richard C.: *See—*
Sonu, Gene H.; and Schneider, Richard C., 4,531,165, Cl. 360-65.000.
Schnyder, Eugen: *See—*
Schlatter, Beat; and Schnyder, Eugen, 4,530,227, Cl. 72-241.000.
Schraff, Raymond J.: *See—*
Miller, Thomas M.; and Schraff, Raymond J., 4,530,441, Cl. 220-215.000.
Schreck, Carl E.: *See—*
McGovern, Terrence P.; and Schreck, Carl E., 4,530,935, Cl. 514-613.000.
Schroers, Otto: *See—*
Hubner, Wolfgang; Klein, Helmut; Goldacker, Erhard; and Schroers, Otto, 4,530,943, Cl. 523-318.000.
Schuett, Walter: *See—*
Buerkle, Ottmar; Schmidts, Kurt; Schneider, Alfred; and Schuett, Walter, 4,530,475, Cl. 242-199.000.
Schulke, Karl A.: *See—*
Gutermann, Alfons; Herzog, Heinz; Mohn, Heinrich; and Schulke, Karl A., 4,530,818, Cl. 422-240.000.
Schultz, Fredrick W.: *See—*
Ellsworth, Carroll V.; Schultz, Fredrick W.; and Vastag, Harold J., 4,530,214, Cl. 62-71.000.
Schulz, Jurgen. Printing attachment and printing method. 4,530,282, Cl. 101-177.000.
Schutte, Horst: *See—*
Leuchtenberger, Wolfgang; Kula, Maria-Regina; Hummel, Werner; and Schutte, Horst, 4,530,903, Cl. 435-130.000.
Schutte, Valentin H.: *See—*
Sarges, Heidrun; Kommoss, Klaus; and Schutte, Valentin H., 4,530,252, Cl. 74-388.00R.
Schutten, Herman P., to Eaton Corporation. Variable displacement free piston engine. 4,530,317, Cl. 123-46.00R.
Schwartz, Reinhard: *See—*
Bohm, Martin; Kramer, Manfred; and Schwartz, Reinhard, 4,530,327, Cl. 123-357.000.
Schwarzmann, Matthias: *See—*
Mross, Wolf D.; Schwarzmann, Matthias; Plueckham, Juergen; and Dehler, Juergen, 4,530,910, Cl. 502-24.000.
Schwendemann, Volker: *See—*
Gimpel, Juergen; Schwendemann, Volker; and Gulbins, Erich, 4,530,978, Cl. 525-528.000.
Scifres, Donald R.; and Sprague, Robert A., to Xerox Corporation. Beam collimation and focusing of multi-emitter or broad emitter lasers. 4,530,574, Cl. 350-420.000.
Scordo, Dominick: *See—*
Colton, John R.; Scordo, Dominick; and Simmons, David M., 4,531,024, Cl. 179-2.0TS.
Scott Bader Company Limited: *See—*
Alexander, Ian J., 4,530,962, Cl. 525-31.000.
Scott & Fetzer Company, The: *See—*
Quinn, Anthony W.; McKee, Donald S.; and Rader, Richard B., 4,530,389, Cl. 160-46.000.
Scott, Lewis A.: *See—*
Gibson, Duane M.; and Scott, Lewis A., 4,530,258, Cl. 76-25.00A.
Scott, Melvin: *See—*
Brierley, John M.; and Scott, Melvin, 4,530,775, Cl. 252-128.000.
Scriven, Roger L.: *See—*
Christenson, Roger M.; Scriven, Roger L.; Jerabek, Robert D.; Koren, Jeffrey G.; and Johnson, Mark W., 4,530,945, Cl. 523-400.000.
Scriver, Richard M.: *See—*
Armbruster, Robert G.; and Scriver, Richard M., 4,530,959, Cl. 524-526.000.
Scrutchin, Thomas W., Jr.: *See—*
Brownell, Kendrick C., Jr.; and Scrutchin, Thomas W., Jr., 4,531,120, Cl. 340-723.000.
Sebastiano, Francesco: *See—*
Pinelli, Tazio; and Sebastiano, Francesco, 4,530,576, Cl. 350-452.000.
Seco Industries, Inc.: *See—*
Moss, Theron C., 4,530,130, Cl. 15-229.00A.
Sederquist, Richard A., to United Technologies Corporation. Process for humidifying a gaseous fuel stream. 4,530,886, Cl. 429-13.000.
Seedhouse, Frederick A.: *See—*
Green, Frederick A.; and Seedhouse, Frederick A., 4,530,592, Cl. 355-11.000.
Seeger, Karl: *See—*
Drews, Ulrich; Mezger, Manfred; Schmidt, Bernhard; Seeger, Karl; Sohner, Gerhard; and Roozenbeek, Herman, 4,531,190, Cl. 364-431.110.
Seeger, Richard W. Art objects and methods of producing same. 4,530,863, Cl. 428-13.000.

Seikel, Wolfgang: *See—*
Mathes, Josef; Abendroth, Paul; Holl, Roland; and Seikel, Wolfgang, 4,530,283, Cl. 101-230.000.

Seiler, Ernst; and Lang, Wilhelm, to Fatzer AG. Method and apparatus for making stranded wires or cables. 4,530,205, Cl. 57-9.000.

Seiler, Wolfgang, to FA. Oskar Schleicher. Single-leg hook for a double lift open shed Jacquard loom. 4,530,380, Cl. 139-59.000.

Seitz, Michael E. A., to Standard Register Company, The. Color developers for pressure-sensitive or heat-sensitive recording papers. 4,531,139, Cl. 346-201.000.

Sekine, Jiro: *See—*
Hara, Hiroshi; Tobioka, Takashi; Yoshino, Takeshi; Nishikawa, Tetuo; and Sekine, Jiro, 4,530,582, Cl. 354-203.000.

Sekisui Kaseihin Kogyo Kabushiki Kaisha: *See—*
Taniuchi, Akira; Nishibori, Setsuo; Komori, Hirohito; and Hayashi, Motoshige, 4,530,880, Cl. 428-402.000.

Sela, Richard, to ARR-Tech Manufacturing, Inc. Stacking apparatus for flexible, generally planar food products. 4,530,632, Cl. 414-35.000.

Selero Limited: *See—*
Hofmann, Helmut J., 4,530,125, Cl. 15-1.700.

Selin, Johan-Fredrik; Huttunen, Jouko; Turunen, Olli; Fors, Jan; Eklund, Vidar; and Ekman, Kurt, to Neste OY. Method of producing cellulose carbamate fibers or films. 4,530,999, Cl. 536-30.000.

Selman, Charles M.: *See—*
Parlman, Robert M.; and Selman, Charles M., 4,530,982, Cl. 526-115.000.

Semen, John: *See—*
Borman, Willem F. H.; and Semen, John, 4,530,878, Cl. 428-334.000.

Semple, Carol M.: *See—*
Semple, Harry F., 4,530,318, Cl. 123-90.170.

Semple, Harry F., to Semple, Carol M. Intake and exhaust valve system for internal combustion engine. 4,530,318, Cl. 123-90.170.

Senco Products, Inc.: *See—*
Vornberger, George F., 4,530,455, Cl. 227-130.000.

Sepso, Roger P., to Robertshaw Controls Company. Refrigeration system, control device therefor and methods of making the same. 4,530,216, Cl. 62-89.000.

Seragen Diagnostics Inc.: *See—*
Marshall, David L., 4,530,900, Cl. 435-7.000.

Serbin, David J.: *See—*
Gutierrez, Richard; Kay, Edward L.; and Serbin, David J., 4,530,995, Cl. 528-930.000.

Setzer, Russell G.: *See—*
Kaplan, Gerald S.; and Setzer, Russell G., 4,531,208, Cl. 370-7.000.

Shabel, Barrie S., to Aluminum Company of America. Rapid determination of metal strength from hardness tests. 4,530,235, Cl. 73-81.000.

Shade, Floyd J.: *See—*
Goodnow, Robert A.; Shade, Floyd J.; and Sloboth, Thomas A., 4,530,832, Cl. 424-92.000.

Shaffer, David T.: *See—*
Gingerich, David J.; Rose, William H.; Rupnik, David W.; and Shaffer, David T., 4,531,030, Cl. 200-68.200.
Meehan, Robert F.; Rose, William H.; and Shaffer, David T., 4,530,552, Cl. 339-17.0CF.

Shaked, Ze'ev; and Wolfe, Sidney N., to Cetus Corporation. Controlled oxidation of microbially produced cysteine-containing proteins. 4,530,787, Cl. 260-112.00R.

Shamie, Louis. Double action crib drop side lock. 4,530,528, Cl. 292-60.000.

Shannon, Michael A.; and McDade, John A., to Northern Telecom Limited. Production of dielectric insulation layers upon electrical conductors. 4,530,851, Cl. 427-9.000.

Sharp Kabushiki Kaisha: *See—*
Morino, Masuaki; Fujikawa, Yoshiyuki; Haneda, Isamu; and Myoi, Tetsuo, 4,531,194, Cl. 364-705.000.
Saitoh, Kiyonobu; and Fujiwara, Katsuyoshi, 4,530,494, Cl. 271-9.000.

Shaw, Herbert J.; Chodorow, Marvin; and Stokes, Loren F., to Leland Stanford Jr. Univ., The Board of Trustees of. Stabilized fiber optic sensor. 4,530,603, Cl. 356-345.000.

Sheets, Keith A.; and Eby, Devon L., to Chore-Time Equipment, Inc. Level control for trough filling apparatus. 4,530,308, Cl. 119-52.00B.

Shell Oil Company: *See—*
Broekhuis, Antonius A., 4,530,985, Cl. 526-181.000.
Harris, Martin, 4,531,002, Cl. 544-54.000.
Ryan, Robert C.; Adams, Charles T.; and Washecheck, Don M., 4,530,911, Cl. 502-74.000.

Shelton, William A.: *See—*
Canter, Joseph M.; and Shelton, William A., 4,531,078, Cl. 315-151.000.

Shepherd, Freeman D., Jr.; Pellegrini, Paul W.; Ludington, Charlotte E.; and Weeks, Melanie M., to United States of America, Air Force. Self-guarding Schottky barrier infrared detector array. 4,531,055, Cl. 250-211.00J.

Sherrill, Jimmy L., to Tutco, Inc. Insulator for an electric heater. 4,531,017, Cl. 174-138.00J.

Shibano, Fumehiko, to Iwatsu Electric Co., Ltd. Optoelectronic system for measuring electric or magnetic quantities utilizing a dual light beam of different wavelengths. 4,531,092, Cl. 324-244.000.

Shibata, Kiyoshi: *See—*
Kimura, Hiroshi; Hisajima, Masahiko; Shibata, Kiyoshi; Irie, Yoichiro; Morimoto, Kiyoshi; Nagashima, Takashi; Yoshikawa, Yasuhiko; Watashi, Masahiro; Yamamoto, Kiyonori; Yamamoto, Toshihiko; and Yoshinaga, Shinsuke, 4,530,588, Cl. 355-3.0DR.

Shimada, Nobuyoshi: *See—*
Umezawa, Hamao; Takeuchi, Tomio; Ishizuka, Masaaki; Takita, Tomohisa; Shimada, Nobuyoshi; and Kato, Kuniki, 4,530,998, Cl. 536-24.000.

Shimada, Takeo: *See—*
Matsuura, Mitsuyuki; Kageyama, Yoshiteru; Hagiwara, Akito; and Shimada, Takeo, 4,530,983, Cl. 526-125.000.

Shimano Industrial Company Limited: *See—*
Nagano, Masashi, 4,530,677, Cl. 474-80.000.

Shimizu, Takao: *See—*
Nawa, Akiyoshi; Kato, Yoshiaki; and Shimizu, Takao, 4,531,040, Cl. 219-74.000.

Shimizu, Yasumi; and Nakata, Tetsuya, to Osaka Suda Co Ltd. Rubbery solid polymer or copolymer of glycidyl carboxylate and composition thereof. 4,530,994, Cl. 525-403.000.

Shimohira, Takajiro: *See—*
Makishima, Akio; Nagata, Tatsuya; and Shimohira, Takajiro, 4,530,909, Cl. 501-73.000.

Shimura, Masuo. Water surface flotage suctioning apparatus. 4,530,760, Cl. 210-242.300.

Shindo, Mizuo; Yamamoto, Takashi; Fukunaga, Osamu; and Yamamori, Hisayoshi, to Mitsubishi Rayon Co., Ltd. Process for making microporous polyethylene hollow fibers. 4,530,809, Cl. 264-210.700.

Shinmi, Hideo; and Kubota, Yoshitaka, to Toray Silicone Company, Ltd. Elastomer-coated cloth composite. 4,530,868, Cl. 428-57.000.

Shipley Company Inc.: *See—*
Christensen, Carl W.; and Isaacson, Calvin, 4,530,896, Cl. 430-155.000.

Shiraki, Toshinori; Yamori, Akio; and Morita, Hideo, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for continuously polymerizing a block copolymer and the block copolymer mixture obtained therefrom. 4,530,966, Cl. 525-89.000.

Shiraki, Toshinori; Yamori, Akio; and Morita, Hideo, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for continuously polymerizing a block copolymer and the block copolymer mixture obtained therefrom. 4,530,967, Cl. 525-89.000.

Shirato, Takehide, to Fujitsu Limited. Method of forming conductive channel extensions to active device regions in CMOS device. 4,530,150, Cl. 29-576.00B.

Shirn, George A.; and Pfister, William J., to Sprague Electric Company. Electrolytic capacitor containing a hydrochloric acid electrolyte. 4,531,177, Cl. 361-433.000.

Shiroto, Yoshimi; Nakata, Shinichi; and Hashimoto, Hideki, to Chiyoda Chemical Engineering & Construction Co., Ltd. Method of converting heavy hydrocarbon oils into light hydrocarbon oils. 4,530,753, Cl. 208-68.000.

Shiroto, Yoshimi; Nakata, Shinichi; and Hashimoto, Hideki, to Chiyoda Chemical Engineering & Construction Co., Ltd. Process for the conversion of heavy hydrocarbon oils into light hydrocarbon oils. 4,530,754, Cl. 208-68.000.

Shoji, Yuji: *See—*
Moroishi, Taishi; Fujikawa, Hisao; Murayama, Junichiro; and Shoji, Yuji, 4,530,720, Cl. 75-128.00A.

Shomura, Eiichi: *See—*
Takenoya, Hideaki; Kuribayashi, Nobumitu; and Shomura, Eiichi, 4,530,296, Cl. 112-229.000.

Shoup, Thomas E.; Maykut, Dennis J.; and Eagar, Thomas W., to TRW Inc. Large diameter stud and method and apparatus for welding same. 4,531,042, Cl. 219-99.000.

Shu, Paul: *See—*
Rankel, Lillian A.; and Shu, Paul, 4,530,757, Cl. 208-251.00R.

Shu, Winston R.: *See—*
Hartman, Kathy J.; and Shu, Winston R., 4,530,401, Cl. 166-303.000.

Shufflebarger, Earl D.: *See—*
Bork, Carl R., Jr.; Steiss, William C.; Tobbe, William P.; Shufflebarger, Earl D.; Matousek, Stephen; and Gardner, Thomas J., 4,530,373, Cl. 137-516.290.

Shukuri, Kastuhiro: *See—*
Kawamoto, Kiyoaki; Shukuri, Kastuhiro; Hashimoto, Takayoshi; Yamazaki, Yoshio; and Inowa, Shigeru, 4,530,596, Cl. 355-15.000.

Siemens Aktiengesellschaft: *See—*
Beyer, Guenter; Hauptmann, Rudolf; and Peters, Rainer, 4,531,125, Cl. 343-7.900.
Foissner, Herbert; Krautwald, Herbert; and Minke, Lutz, 4,531,019, Cl. 174-163.00F.
Hetz, Walter, 4,530,362, Cl. 128-660.000.
Maerkl, Michael; and Matzner, Joseph, 4,531,163, Cl. 360-49.000.
Schmid, Eberhard; and Brehler, Robert, 4,531,086, Cl. 323-222.000.
Weyrich, Claus; Ziegler, Guenther; Hoffmann, Ludwig; and Theis, Dietmar, 4,531,142, Cl. 357-17.000.

Sig Societe Industrielle Suisse: *See—*
Jaquet, Andre , 4,531,053, Cl. 250-201.000.

Sigety, Stephen, Jr., to General Motors Corporation. Vehicle hood support and secondary latch. 4,530,412, Cl. 180-69.210.

Siguier, Max: *See—*
Benichou, Alain; and Siguier, Max, 4,530,206, Cl. 57-250.000.

Simmons, David M.: *See—*
Colton, John R.; Scordo, Dominick; and Simmons, David M., 4,531,024, Cl. 179-2.0TS.

Simo, Miroslav A. Archery bow. 4,530,342, Cl. 124-24.00R.

Simon, Daniel, to Jeumont-Schneider Corporation. Rotary optical connector. 4,530,567, Cl. 350-96.200.

Simon, Ulrich; and Beutel, Rainer, to Hoechst Aktiengesellschaft. Aqueous-alkaline solution and process for developing positive-working reproduction layers. 4,530,895, Cl. 430-145.000.
Simons, Barbara B.: *See*—
Halpern, Joseph Y.; Simons, Barbara B.; and Strong, Hovey R., 4,531,185, Cl. 364-200.000.
Simpson, Clyde B.: *See*—
McKaba, William; and Simpson, Clyde B., 4,530,830, Cl. 424-71.000.
Simpson, Larry W.: *See*—
Bluestein, Leo I.; Crandell, Paul E.; Drake, David A.; Jedynak, Leo; and Simpson, Larry W., 4,531,021, Cl. 178-22.080.
Wechselberger, Anthony J.; Bluestein, Leo I.; Jedynak, Leo; Drake, David A.; and Simpson, Larry W., 4,531,020, Cl. 178-22.080.
Singer Company, The: *See*—
Szostak, Jan; and Schaeflern, Henry, 4,530,298, Cl. 112-315.000.
Sintef: *See*—
Ugelstad, John; and Berge, Arvid, 4,530,956, Cl. 524-458.000.
Sippel, David F.; and Kearns, Robert L., to General Electric Company. Method and apparatus for masking a surface of a blade member. 4,530,861, Cl. 427-444.000.
Skeel, James C., to J. I. Case Company. Parking brake declutching system. 4,530,427, Cl. 192-4.00A.
Skinner, James T., Jr. Text comparator. 4,531,201, Cl. 364-900.000.
Skriba, Michael C.: *See*—
Smeltzer, Eugene E.; and Skriba, Michael C., 4,530,723, Cl. 106-90.000.
Slater, Michael: *See*—
Topol, Peter; and Slater, Michael, 4,531,114, Cl. 340-539.000.
Sloboth, Thomas A.: *See*—
Goodnow, Robert A.; Shade, Floyd J.; and Sloboth, Thomas A., 4,530,832, Cl. 424-92.000.
Smeltzer, Eugene E.; and Skriba, Michael C., to Westinghouse Electric Corp. Encapsulation of ion exchange resins. 4,530,723, Cl. 106-90.000.
Smerbeck, Richard V.; and Pittz, Eugene P., to Warner-Lambert Company. Synergistic non-steroidal anti-inflammatory compounds and compositions thereof. 4,530,844, Cl. 514-458.000.
Smith, Alan M.; and Taylor, Peter J., to BICC Public Limited Company. Optical fiber duplex coupler. 4,530,566, Cl. 350-96.200.
Smith, Eric M. Method and apparatus for the producing of liquid hydrogen. 4,530,744, Cl. 204-129.000.
Smith, John W., to Systems International, Inc. Frame and body repair apparatus. 4,530,232, Cl. 72-447.000.
Smith, Leonard E.; and Johnson, James, to IMNETEC Inc. Device for exercise and/or therapy. 4,530,496, Cl. 272-68.000.
Smith, Robert C.; and Holman, George B., Jr., to Standard Oil Company. Low density spacer fluid. 4,530,402, Cl. 166-291.000.
Smith, Robert L. Roof ventilator. 4,530,273, Cl. 98-42.010.
Smith, Walter P.; and Nacht, Sergio, to Richardson-Vicks Inc. Nail conditioner. 4,530,828, Cl. 424-61.000.
Smitka, Tim A.: *See*—
Bunge, Richard H.; French, James C.; Hurley, Timothy R.; Smitka, Tim A.; and Tunac, Josefino B., 4,530,835, Cl. 424-117.000.
SMS Schloemann-Siemag AG: *See*—
Hild, Berthold; Braun, Martin; and Munker, Max, 4,530,224, Cl. 72-15.000.
Snial Resine Poliestere S.p.A.: *See*—
Arcuri, Luigi; Bertotti, Elvio; Carignani, Giancarlo; Cipriani, Aldo; Donato, Aldo; and Grossi, Giuseppe, 4,530,783, Cl. 252-628.000.
Snyder, Walter W; and Dettmer, Dennis G., to National Can Corporation. Apparatus for producing seamless container bodies. 4,530,228, Cl. 72-349.000.
Societa Italiana Resine S.T.R. S.p.A.: *See*—
Radici, Pierino, 4,530,980, Cl. 526-73.000.
Societa' Italiana Vetro - SIV - S.p.A.: *See*—
Pinelli, Tazio; and Sebastiano, Francesco, 4,530,576, Cl. 350-452.000.
Societe Anonyme D'Explosifs et de Produits Chimiques & Max Siguier: *See*—
Benichou, Alain; and Siguier, Max, 4,530,206, Cl. 57-250.000.
Societe d'Applications Generales d'Electricite et de Mecanique Sagem: *See*—
Barriac, Jacques, 4,530,164, Cl. 33-324.000.
Barriac, Jacques, 4,530,237, Cl. 73-178.00R.
Societe d'Etude du Radant: *See*—
Sadones, Henri, 4,531,126, Cl. 343-17.700.
Societe Nouvelle Terseram-Megras: *See*—
Verdenne, Jean, 4,530,281, Cl. 101-104.000.
Sofec, Inc.: *See*—
Pedersen, Kristen I., 4,530,302, Cl. 114-230.000.
Sohner, Gerhard: *See*—
Drews, Ulrich; Mezger, Manfred; Schmidt, Bernhard; Seeger, Karl; Sohner, Gerhard; and Roozenbeek, Herman, 4,531,190, Cl. 364-431.110.
Solex (U.K.) Limited: *See*—
Pagdin, Brian C., 4,530,334, Cl. 123-494.000.
Solid State Chargers Research and Development Limited Partnership: *See*—
Hoffman, Philip A., 4,531,083, Cl. 320-9.000.
Hoffman, Philip A., 4,531,084, Cl. 320-39.000.
Somerfield, Kenneth T.: *See*—
Atkinson, Alan W.; Hurst, David R.; and Somerfield, Kenneth T., 4,530,949, Cl. 523-512.000.
Sommer, Gerald, to International Shoe Machine Corporation. Device for toe and ball lasting of a shoe unit. 4,530,124, Cl. 12-12.400.
Sommers, Hans: *See*—
Altemark, Detlef; Sommers, Hans; and Weid, Manfred, 4,530,656, Cl. 431-8.000.
Sonu, Gene H.; and Schneider, Richard C., to International Business Machines Corporation. Automatic amplitude equalizer based upon monitoring of channel power loss. 4,531,165, Cl. 360-65.000.
Sony Corporation: *See*—
Katsube, Kazuaki; and Kuwabara, Masami, 4,530,557, Cl. 339-75.00M.
Terajima, Jiro; Suzuki, Tadahiko; and Nagasawa, Hisamichi, 4,531,026, Cl. 200-5.00R.
Watanabe, Kenji, 4,531,153, Cl. 358-141.000.
Soper, Richard S.: *See*—
McCabe, Dennis; and Soper, Richard S., 4,530,834, Cl. 424-93.000.
Sosnowski, John: *See*—
Ritchie, Joseph M.; Chang, Bong H.; and Sosnowski, John, 4,530,755, Cl. 208-96.000.
South, Robert E. Electrical outlet guard. 4,530,555, Cl. 339-39.000.
Southern Research Institute: *See*—
Tice, Thomas R.; Lewis, Danny H.; Cowsar, Donald R.; and Beck, Lee R., 4,530,840, Cl. 514-179.000.
Southwest Research Institute: *See*—
Rollwitz, William L.; and King, James D., 4,531,093, Cl. 324-300.000.
Sovis, Milo D., Jr.: *See*—
Jasperse, Philip D.; Weis, Siegfried K.; and Sovis, Milo D., Jr., 4,530,609, Cl. 384-482.000.
Spamer, William S.; and Beerman, Ronald J., to Mead Corporation, The. Article dispenser. 4,530,548, Cl. 312-45.000.
Span, Richard M.: *See*—
Freeman, Willie B.; and Span, Richard M., 4,531,031, Cl. 200-82.00B.
Spector, George: *See*—
Labick, Richard A.; and Spector, George, 4,530,129, Cl. 15-184.000.
Sperber, Henry. Reduced fiber insulation nozzle. 4,530,468, Cl. 239-419.300.
Sperry Corporation: *See*—
Liesegang, Terrence R., 4,531,081, Cl. 318-632.000.
Scheuneman, James H., 4,531,213, Cl. 371-3.000.
Walker, James D., 4,530,279, Cl. 100-5.000.
Spevack, Jerome S. System for producing steam and mechanical energy from a hydrothermal flow. 4,530,211, Cl. 60-641.500.
Spiegal, Arnold, to Polaroid Corporation. Photographic products and processes providing a negative image. 4,530,898, Cl. 430-403.000.
Spiegel, Martin A.; and Weid, Greg, to Mr. Gasket Company. Non-ferrous wheel center with chromed steel cover. 4,530,542, Cl. 301-37.00R.
Sprague Electric Company: *See*—
Shirn, George A.; and Pfister, William J., 4,531,177, Cl. 361-433.000.
Sprague, Robert A.: *See*—
Scifres, Donald R.; and Sprague, Robert A., 4,530,574, Cl. 350-420.000.
Spraymation, Inc.: *See*—
Kerzel, David, 4,530,862, Cl. 427-445.000.
Sprenger, Walter. Cable protection device. 4,530,865, Cl. 428-36.000.
Springer, Earl W. Tester for aircraft altitude reporting system. 4,531,127, Cl. 343-17.700.
Springs Industries, Inc.: *See*—
Hendrix, James E.; Daniels, John Y.; and Jackson, Bobby D., 4,530,874, Cl. 428-266.000.
Spurlin, William V., to Syn-Energy, Inc. Center flow feeder and vibratory conveyor. 4,530,431, Cl. 198-534.000.
Square D Company: *See*—
Rickmann, Bernard C., 4,531,174, Cl. 361-339.000.
Squire, Edward N., to Du Pont de Nemours, E. I., and Company. Optical fibers comprising cores clad with amorphous copolymers of perfluoro-2,2-dimethyl-1,3-dioxole. 4,530,569, Cl. 350-96.340.
Srivastava, Prem C.: *See*—
Robins, Roland K.; and Srivastava, Prem C., 4,531,001, Cl. 536-55.000.
Stackling, Hakan, to Aktiebolaget SKF. Multiple-row roller bearing with a guiding ring. 4,530,610, Cl. 384-560.000.
Stahl, William L., Jr.: *See*—
Kraft, Wayne R.; Moore, Victor S.; Stahl, William L., Jr.; and Thoma, Nandor G., 4,531,068, Cl. 307-473.000.
Stahlbaum, Heinz: *See*—
Redlich, Horst; and Stahlbaum, Heinz, 4,531,207, Cl. 369-173.000.
Standard Container Company: *See*—
Vogel, William M., Jr.; Weingardt, Rolf E.; O'Guin, Waco J.; and Littenberg, Joseph S., 4,530,442, Cl. 220-354.000.
Standard Oil Company: *See*—
Smith, Robert C.; and Holman, George B., Jr., 4,530,402, Cl. 166-291.000.
Standard Register Company, The: *See*—
Seitz, Michael E. A., 4,531,139, Cl. 346-201.000.
Stanley, Haydn T.; and Drake, Derek J., to Willards Foods Limited. Method of producing corrugated crisps. 4,530,849, Cl. 426-439.000.
Starr, James B., to Honeywell Inc. Semiconductor pressure transducer. 4,530,244, Cl. 73-727.000.
Starrett, John D. Stringed musical instrument. 4,530,268, Cl. 84-1.160.

State of Israel-Ministry of Agriculture: *See—*
Sarig, Yoav; Regev, Yitzhak; and Grosz, Friedrich, 4,530,278, Cl. 99-547.000.
Stauffer Chemical Company: *See—*
Chang, Pei K., 4,530,788, Cl. 260-123.500.
Timony, Peter E., 4,530,772, Cl. 252-56.00S.
Steffes, Helmut, to ITT Industries, Inc. Control arrangement for a vehicular brake system with hydraulic brake booster. 4,530,209, Cl. 60-547.100.
Stein, Martin L.: *See—*
Aisenberg, Sol; and Stein, Martin L., 4,530,750, Cl. 204-298.000.
Steiss, William C.: *See—*
Bork, Carl R., Jr.; Steiss, William C.; Tobbe, William P.; Shufflebarger, Earl D.; Matousek, Stephen; and Gardner, Thomas J., 4,530,373, Cl. 137-516.290.
Stensele Mekaniska Verkstad AB: *See—*
Hedberg, Allan, 4,530,266, Cl. 83-801.000.
Stephan, Hans-Werner: *See—*
Wolter, Manfred; Dorn, Friedrich-Wilhelm; Heymer, Gero; and Stephan, Hans-Werner, 4,530,769, Cl. 210-769.000.
Stephens, Donald L., to Paccar Inc. Apparatus for clamping a hose onto a coolant tube. 4,530,524, Cl. 285-187.000.
Stereoscopes Lestrade & Cie., S.A.: *See—*
Vitrac, Jean-Pierre, 4,530,570, Cl. 350-241.000.
Stevens, Richard D.: *See—*
Everson, William G.; and Stevens, Richard D., 4,530,686, Cl. 493-315.000.
Stewart, David B.: *See—*
Stewart, William R.; Stewart, David B.; and Dickinson, John M. C., 4,530,133, Cl. 19-97.000.
Stewart, Lawrence C.: *See—*
Rawson, Eric G.; Murray, Hallam G.; Schmidt, Ronald V.; and Stewart, Lawrence C., 4,531,238, Cl. 455-601.000.
Stewart, William R.; Stewart, David B.; and Dickinson, John M. C., to Wm. R. Stewart & Sons (Hacklemakers) Ltd. Opening roller for open end spinning machines. 4,530,133, Cl. 19-97.000.
Sticht, Walter, to Stiwa-Fertigungstechnik Sticht Gesellschaft m.b.H. Conveyor arrangement. 4,530,287, Cl. 104-168.000.
Stichting Energieonderzoek Centrum Nederland: *See—*
Van Holten, Theodoor, 4,530,644, Cl. 416-175.000.
Stickle, John S.; and Sabatasso, Louis F., to Sabatasso, Louis. Taco boat fryer. 4,530,275, Cl. 99-353.000.
Stickles, David L.: *See—*
Homan, Gary R.; and Stickles, David L., 4,530,882, Cl. 428-452.000.
Stiff, Rodney A.; and Baker, Malcolm J., to Versatile Corporation. Billet planter. 4,530,293, Cl. 111-2.000.
Stiwa-Fertigungstechnik Sticht Gesellschaft m.b.H.: *See—*
Sticht, Walter, 4,530,287, Cl. 104-168.000.
Stocker, Lajos: *See—*
Czegledi, Bela; Csovari, Mihaly; Erdelyi, Miklos; Illi, Jozsef; Stocker, Lajos; Szoke, Attila; Szabo nee Mogyorosi, Katalin; Riederauer, Szilard; Urmossy, Miklos; Terenyi, Gyula; and Csurgai, Istvan, 4,530,819, Cl. 423-112.000.
Stockner, Alan R.: *See—*
Gibson, Dennis H.; and Stockner, Alan R., 4,530,331, Cl. 123-450.000.
Stohlquist, Roger H., to APV Anderson Bros. Inc. Packaging apparatus for stick confections. 4,530,435, Cl. 209-592.000.
Stokes, Konrad H., to International Business Machines Corporation. Method for controlling contamination in a clean room. 4,530,272, Cl. 98-33.00A.
Stokes, Loren F.: *See—*
Shaw, Herbert J.; Chodorow, Marvin; and Stokes, Loren F., 4,530,603, Cl. 356-345.000.
Stoll, Kurt. Plug connection system. 4,530,618, Cl. 403-322.000.
Stolle Corporation, The: *See—*
Kaminski, Elton G.; and McEldowney, Carl F., 4,530,631, Cl. 413-12.000.
Stolle Research and Development Corporation, The: *See—*
Tice, Thomas R.; Lewis, Danny H.; Cowsar, Donald R.; and Beck, Lee R., 4,530,840, Cl. 514-179.000.
Stone, Robert P., to RCA Corporation. Electron gun having arc suppression means. 4,531,075, Cl. 315-3.000.
Storage Technology Corporation: *See—*
Anderson, Robert L., 4,531,166, Cl. 360-73.000.
Stout, Garry A.; and Ray, Donald L., to Emhart Industries, Inc. Timer with improved switch blade arrangement. 4,531,028, Cl. 200-38.00R.
Stover, Kenneth W., to Bunn-O-Matic Corporation. Beverage brewing apparatus with constant temperature water reservoir. 4,531,046, Cl. 219-297.000.
Strand, Mette, to Johns Hopkins University, The. Diagnosis and treatment of fluke infections with monoclonal antibodies. 4,530,908, Cl. 436-536.000.
Strepparola, Ezio: *See—*
Moggi, Giovanni; Flabbi, Luciano; and Strepparola, Ezio, 4,530,969, Cl. 525-180.000.
Strohl, Willi: *See—*
Maisch, Wolfgang; Nusser, Hermann; Peters, Klaus-Jurgen; and Strohl, Willi, 4,530,329. Cl. 123-447.000.
Strong, Hovey R.: *See—*
Halpern, Joseph Y.; Simons, Barbara B.; and Strong, Hovey R., 4,531,185, Cl. 364-200.000.
Strowik, Willibald: *See—*
Kluting, Bernd; Ebeling, Peter; and Strowik, Willibald, 4,530,481, Cl. 248-394.000.
Strunk, William R.: *See—*
O'Brien, Larry S.; and Strunk, William R., 4,530,660, Cl. 432-32.000.
Stucki, Peter: *See—*
Butera, William J.; and Stucki, Peter, 4,530,612, Cl. 400-232.000.
Stuff, Alfred O. Golf club head. 4,530,505, Cl. 273-164.000.
Sugano, Motoshi: *See—*
Ohta, Tomozo; Tsutsumi, Yoshio; and Sugano, Motoshi, 4,531,148, Cl. 358-21.00R.
Sugi, Hideki: *See—*
Matsumoto, Mutsumi; and Sugi, Hideki, 4,530,916, Cl. 502-209.000.
Sugie, Masuo; Kurihara, Koji; Aiba, Yoshiro; Komatsu, Nobiru; Ootuka, Haruo; and Nishikido, Kaoru, to Toshiba Ceramics Co., Ltd.; and Nippon Steel Corporation. Porous ceramic structure. 4,530,864, Cl. 428-35.000.
Sugiura, Nobuo: *See—*
Yanaihara, Noboru; Sugiura, Nobuo; and Kashimoto, Kazuhisa, 4,530,836, Cl. 514-16.000.
Sullivan, John: *See—*
Lillibridge, Harold R.; and Sullivan, John, 4,531,038, Cl. 219-10.810.
Sullivan, Nadine M.: *See—*
Wilkins, Tracy D.; and Sullivan, Nadine M., 4,530,833, Cl. 424-92.000.
Sulzer Brothers Limited: *See—*
Frey, Otto, 4,530,116, Cl. 623-23.000.
Sulzer-Escher Wyss Limited: *See—*
Schlatter, Beat; and Schnyder, Eugen, 4,530,227, Cl. 72-241.000.
Sumi, Yasuo, to Nissan Motor Company, Limited. Supercharger for an engine with an engine-powered auxiliary device. 4,530,338, Cl. 123-559.000.
Sumino, Toshihiko: *See—*
Komatsu, Tatsuyoshi; Numata, Shigeaki; Hioki, Katsuhiko; and Sumino, Toshihiko, 4,530,745, Cl. 204-130.000.
Sumitomo Chemical Co., Ltd.: *See—*
Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, 4,531,008, Cl. 549-447.000.
Omura, Takashi; Harada, Naoki; and Tezuka, Yasuo, 4,530,996, Cl. 534-642.000.
Sumitomo Metal Industries, Ltd.: *See—*
Moroishi, Taishi; Fujikawa, Hisao; Murayama, Junichiro; and Shoji, Yuji, 4,530,720, Cl. 75-128.00A.
Sundstrand Corporation: *See—*
Kintz, Lawrence J., Jr.; and Rossie, Joseph F., 4,531,071, Cl. 310-156.000.
Sung, Rodney L.; Sweeney, William M.; and Kaufman, Benjamin J., to Texaco Inc. Di-hydrocarbyl phosphate quaternary amine salts with an amide of an amino carboxylic acid. 4,530,802, Cl. 260-925.000.
Sunline Hardware, Inc.: *See—*
Konkle, Douglas R., 4,530,136, Cl. 24-608.000.
Surjaatmadja, Jim B.: *See—*
Mosier, John E.; Surjaatmadja, Jim B.; McLawhon, George B.; and Penn, Jack C., 4,531,189, Cl. 364-550.000.
Sutherland, Charles A.: *See—*
Musser, John H.; and Sutherland, Charles A., 4,530,931, Cl. 514-312.000.
Suwa, Kyoichi; Kuramochi, Kazuo; and Nakazawa, Kiwao, to Nippon Kogaku K. K. Positioning method. 4,531,060, Cl. 250-548.000.
Suyama, Tadakazu: *See—*
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,530,926, Cl. 514-214.000.
Suzuki Jidosha Kogyo Kabushiki Kaisha: *See—*
Namba, Yuzuru; and Aoyagi, Kenichi, 4,530,325, Cl. 123-308.000.
Suzuki, Nobuo, to Technical Incorporated. Compact cassette tape recorder with mechanical soft touch operating and switching mechanism. 4,531,168, Cl. 360-96.100.
Suzuki, Sohbe: *See—*
Nishizawa, Jun-ichi; Suzuki, Sohbe; Tamamushi, Takashige; and Arisawa, Yasuo, 4,531,156, Cl. 358-213.000.
Suzuki, Tadahiko: *See—*
Terajima, Jiro; Suzuki, Tadahiko; and Nagasawa, Hisamichi, 4,531,026, Cl. 200-5.00R.
Suzuki, Takeomi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Wavefront light beam splitter. 4,531,054, Cl. 250-201.000.
Suzuki, Takeshi: *See—*
Okano, Masami; Tanaka, Akimasa; Suzuki, Takeshi; Ishida, Akira; and Miyazaki, Tatsuo, 4,531,039, Cl. 219-60.00R.
Suzuki, Toshitake; Arai, Naoto; Aoyagi, Shoji; Saito, Toranosuke; Kitani, Masakatu; and Ishibashi, Takashi, to Kansaki Paper Manufacturing Co. Ltd.; and Sanko Kaihatsu Kagaku Kenkyusho Corporation. Heat-sensitive recording material. 4,531,140, Cl. 346-209.000.
SW Daniel, Inc.: *See—*
Daniel, Wayne, 4,530,417, Cl. 181-223.000.
SW Industries, Inc.: *See—*
Hamed, Parviz, 4,530,944, Cl. 523-335.000.
Swanson, Larry: *See—*
Evans, Ronald M.; Swanson, Larry; Vale, Wylie W., Jr.; Rosenfeld, Michael G.; Amara, Susan G.; Brown, Marvin R.; and Rivier, Jean E. F., 4,530,838, Cl. 514-11.000.
Sweeney, William M.: *See—*
Sung, Rodney L.; Sweeney, William M.; and Kaufman, Benjamin J., 4,530,802, Cl. 260-925.000.

Swerdloff, Michael D.: *See*—
Kolc, Jaroslav F.; Swerdloff, Michael D.; Rogic, Milorad M.; Hendrickson, Larry L.; and Van Der Puy, Michael, 4,530,714, Cl. 71-28.000.
Swisher, Gregory M.; and Mathis, Ronald D. Polymer blend composition exhibiting impact resistance. 4,530,968, Cl. 525-96.000.
Symons, Robert S.: *See*—
Evans, Steven J.; and Symons, Robert S., 4,531,103, Cl. 331-83.000.
Syn-Energy, Inc.: *See*—
Spurlin, William V., 4,530,431, Cl. 198-534.000.
Syntex (U.S.A.) Inc.: *See*—
Nestor, John J.; and Vickery, Brian H., 4,530,920, Cl. 514-15.000.
Synthelabo: *See*—
Obitz, Daniel, 4,530,843, Cl. 514-416.000.
Syrbius, Gerhard: *See*—
Koch, Klaus; Klaus, Rainer; Syrbius, Gerhard; and Schaeffer, Hans-Joachim, 4,530,761, Cl. 210-407.000.
Systems International, Inc.: *See*—
Smith, John W., 4,530,232, Cl. 72-447.000.
Szabo, Josef: *See*—
Zverina, Karel; Tluchor, Denek; Szabo, Josef; Polidor, Jaromir; and Kroupa, Petr, 4,531,043, Cl. 219-121.0PP.
Szabo nee Mogyorosi, Katalin: *See*—
Czegledi, Bela; Csovari, Mihaly; Erdelyi, Miklos; Illi, Jozsef; Stocker, Lajos; Szoke, Attila; Szabo nee Mogyorosi, Katalin; Riederauer, Szilard; Urmossy, Miklos; Terenyi, Gyula; and Csurgai, Istvan, 4,530,819, Cl. 423-112.000.
Szekeres, Laszlo : *See*—
Rakoczi, Jozsef; Berenyi nee Poldermann, Edit; Fekete, Bela; Szekeres, Laszlo ; Papp, Gyula; and Keszthelyi nee Udvary, Eva, 4,530,923, Cl. 514-183.000.
Szepesvary nee Toth, Klara: *See*—
Toke, Laszlo ; Agai, Bela; Bitter, Istvan; Pungor, Erno; Szepesvary nee Toth, Klara; Lindner, Erno; Horvath, Maria; and Havas, Jeno, 4,531,007, Cl. 549-351.000.
Szoke, Attila: *See*—
Czegledi, Bela; Csovari, Mihaly; Erdelyi, Miklos; Illi, Jozsef; Stocker, Lajos; Szoke, Attila; Szabo nee Mogyorosi, Katalin; Riederauer, Szilard; Urmossy, Miklos; Terenyi, Gyula; and Csurgai, Istvan, 4,530,819, Cl. 423-112.000.
Szostak, Jan; and Schaeflern, Henry, to Singer Company, The. Arrangement for suppressing noise and preventing faulty stitch formation in a sewing machine. 4,530,298, Cl. 112-315.000.
Szporny, Laszlo : *See*—
Machovich, Raymund; Nagy, Miklos; Gyorgyi nee Edelenyi, Judit; Horvath, Istvan; Low, Miklos; Csomor, Katalin; Karpati, Egon; Szporny, Laszlo ; and Kisfaludy, Lajos, 4,530,964, Cl. 525-61.000.
T&N Materials Research Limited: *See*—
Atkinson, Alan W.; Hurst, David R.; and Somerfield, Kenneth T., 4,530,949, Cl. 523-512.000.
Tagami, Katsutoshi; Takahashi, Tsuneo; Yasui, Shinichiro; and Ichikawa, Akira, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for visually indicating the travel route of an automotive vehicle. 4,531,123, Cl. 340-995.000.
Taiho Pharmaceutical Co., Ltd.: *See*—
Matsushita, Yoh-ichi; Hasegawa, Etsuo; Eshima, Kiyoshi; and Tsuchida, Eishun, 4,530,794, Cl. 260-245.910.
Takagi, Kazumasa; and Yamaguchi, Yasuyuki, to Nissan Motor Company, Ltd. Warning system for indicating absence of emergency spare tire from a spare tire container. 4,531,116, Cl. 340-568.000.
Takahashi, Kenji: *See*—
Okamura, Shigeo; Sato, Yoshihiro; and Takahashi, Kenji, 4,530,140, Cl. 29-110.000.
Takahashi, Tsuneo: *See*—
Tagami, Katsutoshi; Takahashi, Tsuneo; Yasui, Shinichiro; and Ichikawa, Akira, 4,531,123, Cl. 340-995.000.
Takaishi, Tatsuyuki: *See*—
Moriya, Masaichi; Takaishi, Tatsuyuki; Mochida, Haruo; and Takeda, Yoshimitsu, 4,530,185, Cl. 49-280.000.
Takamatsu, Masanori: *See*—
Uno, Toshio; Takamatsu, Masanori; Iuchi, Koji; and Tsukamoto, Goro, 4,530,930, Cl. 514-312.000.
Takaoka, Kazuhiko: *See*—
Ishizuka, Kohei; Kita, Yasuhiro; Maeda, Narimichi; Koya, Masahiro; Takaoka, Kazuhiko; and Kokuryo, Yoshiro, 4,531,089, Cl. 324-99.00D.
Takara Co., Ltd.: *See*—
Ohno, Kouzin, 4,530,670, Cl. 446-94.000.
Takeda Chemical Industries, Ltd.: *See*—
Okada, Yoshiyuki; Inoue, Yoshihiro; and Iwanaga, Koichi, 4,531,005, Cl. 548-116.000.
Takeda, Yoshimitsu: *See*—
Moriya, Masaichi; Takaishi, Tatsuyuki; Mochida, Haruo; and Takeda, Yoshimitsu, 4,530,185, Cl. 49-280.000.
Takegawa, Yujiro, to Tsudakoma Kogyo Kabushiki Kaisha. Weft reservoir controller used for freely changeable alternate weaving on a fluid-jet loom. 4,530,381, Cl. 139-452.000.
Takei, Shushi; and Onuki, Akio, to Tokyo Shibaura Denki Kabushiki Kaisha. Combination magnetic head. 4,531,170, Cl. 360-119.000.
Takemoto, Takeshi: *See*—
Kaneko, Nobuo; Takemoto, Takeshi; and Yasuda, Hiroshi, 4,530,280, Cl. 101-93.020.
Takenoya, Hideaki; Kuribayashi, Nobumitu; and Shomura, Eiichi, to Janome Sewing Machine Industry Co., Ltd. Lower thread tension adjusting device of sewing machines. 4,530,296, Cl. 112-229.000.
Takeuchi, Koji: *See*—
Hirai, Kiyomiki; Takeuchi, Koji; Ito, Nobuo; and Abe, Masahiro, 4,530,991, Cl. 528-123.000.
Takeuchi, Takashi: *See*—
Imamura, Tetsuya; Takeuchi, Takashi; Tetsutani, Takashi; and Yasuda, Shinichiro, 4,530,894, Cl. 430-106.600.
Takeuchi, Tomio: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Ishizuka, Masaaki; Takita, Tomohisa; Shimada, Nobuyoshi; and Kato, Kuniki, 4,530,998, Cl. 536-24.000.
Takimoto, Hiroyuki: *See*—
Maeda, Masaya; Takimoto, Hiroyuki; and Kozuki, Susumu, 4,531,164, Cl. 360-33.100.
Takita, Tomohisa: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Ishizuka, Masaaki; Takita, Tomohisa; Shimada, Nobuyoshi; and Kato, Kuniki, 4,530,998, Cl. 536-24.000.
Takubo, Takayuki; and Otake, Yoshichi, to Victor Company of Japan. Image pickup device having a holding part. 4,531,159, Cl. 358-229.000.
Tamai, Keiko: *See*—
Tanihara, Koichi; Tamai, Keiko; and Yasuda, Seiji, 4,530,768, Cl. 210-719.000.
Tamamushi, Takashige: *See*—
Nishizawa, Jun-ichi; Suzuki, Sohbe; Tamamushi, Takashige; and Arisawa, Yasuo, 4,531,156, Cl. 358-213.000.
Tamura Electric Works, Ltd.: *See*—
Kaneko, Satoshi, 4,531,050, Cl. 235-1.00D.
Tamura, Yoshio: *See*—
Arika, Junji; Itabashi, Keiji; and Tamura, Yoshio, 4,530,824, Cl. 423-328.000.
Tanabe, Sohei: *See*—
Nakayama, Masahito; Iwasaki, Akio; Kimura, Shigeru; Tanabe, Sohei; Mizoguchi, Toshimi; Murakami, Akira; Watanabe, Isamu; Okuchi, Masao; Ito, Hisakatsu; and Mori, Toshihito, 4,530,791, Cl. 260-245.20T.
Tanaka, Akimasa: *See*—
Okano, Masami; Tanaka, Akimasa; Suzuki, Takeshi; Ishida, Akira; and Miyazaki, Tatsuo, 4,531,039, Cl. 219-60.00R.
Tanaka, Atsuo: *See*—
Donomoto, Tadashi; Tatematsu, Yoshiaki; and Tanaka, Atsuo, 4,530,875, Cl. 428-283.000.
Tanaka, Hirokazu: *See*—
Ikushima, Koichi; Tanaka, Hirokazu; Osamu, Ohe; Kino, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Arakawa, Akira; and Imanaka, Hiroshi, 4,530,845, Cl. 514-453.000.
Tanaka, Ryohei: *See*—
Tayama, Toshiyuki; and Tanaka, Ryohei, 4,530,952, Cl. 524-159.000.
Tanaka, Sumio: *See*—
Watanabe, Shigeyoshi; and Tanaka, Sumio, 4,531,202, Cl. 365-104.000.
Tanaka, Toshiaki; Miyazaki, Hiroaki; Etoh, Yukihiro; Kanesaki, Nobukazu; and Iijima, Akihiro, to Nissan Motor Company, Limited. Fuel injection pump for an internal combustion engine. 4,530,324, Cl. 123-300.000.
Tanaka, Yoshito: *See*—
Nakayama, Koichi; and Tanaka, Yoshito, 4,531,065, Cl. 307-200.00A.
Tanihara, Koichi; Tamai, Keiko; and Yasuda, Seiji, to Director-General of the Agency of Industrial Science and Technology. Method for the disposal of waste water containing iron-cyanide complexes. 4,530,768, Cl. 210-719.000.
Taniuchi, Akira; Nishibori, Setsuo; Komori, Hirohito; and Hayashi, Motoshige, to Sekisui Kaseihin Kogyo Kabushiki Kaisha; and Dai-Ichi Kogyo Seiyaku Co., Ltd. Granular organohalide flame retardant additive. 4,530,880, Cl. 428-402.000.
Tarumi, Noriyoshi: *See*—
Itaya, Masahiko; Haneda, Satoshi; Tarumi, Noriyoshi; and Tomono, Makoto, 4,530,595, Cl. 355-15.000.
Tarver, Wilson B., Jr.: *See*—
Kusenberger, Felix N.; Lozano, Albert S.; and Tarver, Wilson B., Jr., 4,531,091, Cl. 324-242.000.
Tasset, Emmett L., to Dow Chemical Company, The. Quantitative test for residual rosin on cleaned circuit boards. 4,530,601, Cl. 356-36.000.
Tatabanvai Szenbanyak: *See*—
Czegledi, Bela; Csovari, Mihaly; Erdelyi, Miklos; Illi, Jozsef; Stocker, Lajos; Szoke, Attila; Szabo nee Mogyorosi, Katalin; Riederauer, Szilard; Urmossy, Miklos; Terenyi, Gyula; and Csurgai, Istvan, 4,530,819, Cl. 423-112.000.
Tatematsu, Yoshiaki: *See*—
Donomoto, Tadashi; Tatematsu, Yoshiaki; and Tanaka, Atsuo, 4,530,875, Cl. 428-283.000.
Tatemoto, Masayoshi; Furukawa, Yasuyoshi; Tomoda, Masayasu; Oka, Masahiko; and Morita, Shigeru, to Daikin Kogyo Co., Ltd. Fluoride-containing polymer and composition containing same. 4,530,972, Cl. 525-276.000.
Taube, Thomas: *See*—
Zollner, Dieter; Lauterbach-Dammler, Inge; Taube, Thomas; Lades, Hans; Liebel, Siegfried; and Bauer, Hanns-Georg, 4,531,219, Cl. 373-101.000.
Tayama, Toshiyuki; and Tanaka, Ryohei, to Mitsubishi Petrochemical Co., Ltd. Polyphenylene ether composition improved in processability. 4,530,952, Cl. 524-159.000.
Taylor, Peter J.: *See*—
Smith, Alan M.; and Taylor, Peter J., 4,530,566, Cl. 350-96.200.

Technical Incorporated: *See*—
Suzuki, Nobuo, 4,531,168, Cl. 360-96.100.
TELDEC Schallplatten GmbH: *See*—
Redlich, Horst; and Stahlbaum, Heinz, 4,531,207, Cl. 369-173.000.
Telecommunications Radioelectriques et Telephoniques: *See*—
Brie, Richard; and Guidoux, Loic B. Y., 4,531,220, Cl. 375-14.000.
Tepic, Slobodan. Total hip joint prostheses. 4,530,114, Cl. 623-23.000.
Terajima, Jiro; Suzuki, Tadahiko; and Nagasawa, Hisamichi, to Sony Corporation. Multiple switch assembly having pulsating secondary contacts. 4,531,026, Cl. 200-5.00R.
Terakura, Yukio: *See*—
Ikemoto, Kazuhito; Terakura, Yukio; and Miyake, Takashi, 4,530,253, Cl. 74-440.000.
Terenyi, Gyula: *See*—
Czegledi, Bela; Csovari, Mihaly; Erdelyi, Miklos; Illi, Jozsef; Stocker, Lajos; Szoke, Attila; Szabo nee Mogyorosi, Katalin; Riederauer, Szilard; Urmossy, Miklos; Terenyi, Gyula; and Csurgai, Istvan, 4,530,819, Cl. 423-112.000.
Tesch, Gunter H. Heat pack and process for the preparation of a heat pack. 4,530,869, Cl. 428-69.000.
Tetsutani, Takashi: *See*—
Imamura, Tetsuya; Takeuchi, Takashi; Tetsutani, Takashi; and Yasuda, Shinichiro, 4,530,894, Cl. 430-106.600.
Tew, Sydney K.; and Bauer, Dan O. Direct drive servovalve and fuel control system incorporating same. 4,530,487, Cl. 251-138.000.
Texaco Inc.: *See*—
Sung, Rodney L.; Sweeney, William M.; and Kaufman, Benjamin J., 4,530,802, Cl. 260-925.000.
Texas Instruments Deutschland GmbH: *See*—
Gotz, Laszlo; and Kowatsch, Hermann, 4,531,097, Cl. 330-254.000.
Tezuka, Yasuo: *See*—
Omura, Takashi; Harada, Naoki; and Tezuka, Yasuo, 4,530,996, Cl. 534-642.000.
Theis, Dietmar: *See*—
Weyrich, Claus; Ziegler, Guenther; Hoffmann, Ludwig; and Theis, Dietmar, 4,531,142, Cl. 357-17.000.
Theodore, Ares N.; and Chattha, Mohinder S., to Ford Motor Company. Non-aqueous dispersions based on capped stabilizers and reactants comprising polyfunctional monomers I. 4,530,957, Cl. 524-504.000.
Theurer, Josef; Folser, Karl; and Oellerer, Friedrich, to Franz Plasser Baumaschinen Industriegesellschaft M.B.H. Ballast cleaning machine. 4,530,403, Cl. 171-16.000.
Thiokol Corporation: *See*—
Youngkeit, Dean, 4,530,855, Cl. 427-175.000.
Thiotech, Inc.: *See*—
Tibbals, Rory L.; and Unger, Kim N., 4,530,758, Cl. 209-166.000.
Thoma, Nandor G.: *See*—
Kraft, Wayne R.; Moore, Victor S.; Stahl, William L., Jr.; and Thoma, Nandor G., 4,531,068, Cl. 307-473.000.
Thoma, Wilhelm: *See*—
Halpaap, Reinhard; Pedain, Josef; Thoma, Wilhelm; and Grammel, Jurgen, 4,530,990, Cl. 528-53.000.
Thomas, Iran L.; and Lai, Chung J., to Occidental Research Corporation. Densification of phosphatic wastes and phosphoric acid slimes and solvent recovery. 4,530,764, Cl. 210-637.000.
Thomas, Stephen E. Method and apparatus for transmitting from within a pneumatic wheel assembly. 4,531,112, Cl. 340-58.000.
Thompson, Larry D.; and Johnson, William R., Jr., to United States of America, Energy. Method for fabricating wrought components for high-temperature gas-cooled reactors and product. 4,530,727, Cl. 148-2.000.
Thompson, Paul D., to DEC International, Inc. Teat cup inflation. 4,530,307, Cl. 119-14.490.
Thomson CSF: *See*—
Lassallette, Jean L.; Lepere, Guy; and Rotat, Gerard, 4,531,124, Cl. 343-5.0DP.
Thurber, Charles H., Jr.; Behrens, Frederick A.; and Hunton, John H., to E-Systems, Inc. Ordnance delivery system and method including remotely piloted or programmable aircraft with yaw-to-turn guidance system. 4,530,476, Cl. 244-3.210.
Tibbals, Rory L.; and Unger, Kim N., to Thiotech, Inc. Ore flotation method. 4,530,758, Cl. 209-166.000.
Tice, Thomas R.; Lewis, Danny H.; Cowsar, Donald R.; and Beck, Lee R., to Stolle Research and Development Corporation, The; and Southern Research Institute. Injectable, long-acting microparticle formulation for the delivery of anti-inflammatory agents. 4,530,840, Cl. 514-179.000.
Tiedemann, Wolfgang O., to Vico Kemisk Tekniska Fabrik AB. Drying of solvent-treated objects. 4,530,165, Cl. 34-32.000.
Timony, Peter E., to Stauffer Chemical Company. Method of electrical contact lubrication. 4,530,772, Cl. 252-56.00S.
Tishken Products, Inc.: *See*—
Granzow, Carl F.; Lash, Edward G.; Gleason, Everett; and Kubiak, Jerome, 4,530,226, Cl. 72-171.000.
Tluchor, Denek: *See*—
Zverina, Karel; Tluchor, Denek; Szabo, Josef; Polidor, Jaromir; and Kroupa, Petr, 4,531,043, Cl. 219-121.0PP.
Tobbe, William P.: *See*—
Bork, Carl R., Jr.; Steiss, William C.; Tobbe, William P.; Shufflebarger, Earl D.; Matousek, Stephen; and Gardner, Thomas J., 4,530,373, Cl. 137-516.290.
Tobioka, Takashi: *See*—
Hara, Hiroshi; Tobioka, Takashi; Yoshino, Takeshi; Nishikawa, Tetuo; and Sekine, Jiro, 4,530,582, Cl. 354-203.000.
Toet, Wilhelmina K.: *See*—
van de Pas, Johannes C.; van Voorst Vader, Frederik; and Toet, Wilhelmina K., 4,530,780, Cl. 252-528.000.
Toke, Laszlo ; Agai, Bela; Bitter, Istvan; Pungor, Erno; Szepesvary nee Toth, Klara; Lindner, Erno; Horvath, Maria; and Havas, Jeno, to Magyar Tudomanyos Akademia. Crown ether compounds, process for the preparation of the crown ether complex forming agents and ion-selective membrane electrodes containing the same. 4,531,007, Cl. 549-351.000.
Toko, Inc.: *See*—
Nakayama, Koichi; and Tanaka, Yoshito, 4,531,065, Cl. 307-200.00A.
Tokumitsu, Junsuke, to Victor Company of Japan, Ltd. Noise control circuit for slow-motion/still-motion video reproduction system. 4,531,162, Cl. 360-10.300.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Fukuhara, Yoshio; and Koizumi, Hideo, 4,531,227, Cl. 378-144.000.
Koyama, Kiyomi, 4,531,191, Cl. 364-491.000.
Masuoka, Fujio; and Iizuka, Hisakazu, 4,531,203, Cl. 365-218.000.
Nakane, Hiroshi, 4,531,099, Cl. 330-267.000.
Takei, Shushi; and Onuki, Akio, 4,531,170, Cl. 360-119.000.
Watanabe, Shigeyoshi; and Tanaka, Sumio, 4,531,202, Cl. 365-104.000.
Tolokan, Robert P.: *See*—
Erickson, Arnold R.; Panzera, Carlino; and Tolokan, Robert P., 4,530,884, Cl. 428-608.000.
Tomala, Ambrose: *See*—
Buike, James W.; and Tomala, Ambrose, 4,530,413, Cl. 180-79.100.
Tomoda, Masayasu: *See*—
Tatemoto, Masayoshi; Furukawa, Yasuyoshi; Tomoda, Masayasu; Oka, Masahiko; and Morita, Shigeru, 4,530,972, Cl. 525-276.000.
Tomono, Makoto: *See*—
Itaya, Masahiko; Haneda, Satoshi; Tarumi, Noriyoshi; and Tomono, Makoto, 4,530,595, Cl. 355-15.000.
Tomy Kogyo Company, Incorporated: *See*—
Yoneda, Yosuke, 4,530,672, Cl. 446-324.000.
Topol, Peter; and Slater, Michael, to Safety Intelligence Systems. Intelligent fire safety system. 4,531,114, Cl. 340-539.000.
Topy Industries, Limited: *See*—
Osawa, Shigeru, 4,530,387, Cl. 152-410.000.
Toray Industries, Inc.: *See*—
Inoue, Toshihide; and Komatsu, Hideo, 4,531,009, Cl. 560-65.000.
Toray Silicone Company, Ltd.: *See*—
Shinmi, Hideo; and Kubota, Yoshitaka, 4,530,868, Cl. 428-57.000.
Torizuka, Keizi, to Diesel Kiki Co., Ltd. In-line type fuel injection pump for internal combustion engines. 4,530,335, Cl. 123-495.000.
Torres, John R.; and Albano, Rocco V., to United Technologies Corporation. Power loss analyzer circuit. 4,531,214, Cl. 371-66.000.
Toshiba Ceramics Co., Ltd.: *See*—
Sugie, Masuo; Kurihara, Koji; Aiba, Yoshiro; Komatsu, Nobiru; Ootuka, Haruo; and Nishikido, Kaoru, 4,530,864, Cl. 428-35.000.
Toshiba Chemical Products Co., Ltd.: *See*—
Mayama, Toshio; and Iwase, Hidehiro, 4,530,779, Cl. 252-507.000.
Toshima, Akira, to Kabushiki Kaisha Toshiba. Thermal transfer type printing apparatus. 4,531,135, Cl. 346-76.0PH.
Totman, Millard C. Acid catalyzed combustion. 4,530,340, Cl. 123-669.000.
Toutant, Roland J. Porting system for pneumatic impact hammer. 4,530,408, Cl. 173-17.000.
Towae, Friedrich: *See*—
Mattner, Otto; Merger, Franz; and Towae, Friedrich, 4,530,796, Cl. 260-453.00P.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Arika, Junji; Itabashi, Keiji; and Tamura, Yoshio, 4,530,824, Cl. 423-328.000.
Toyoda Koki Kabushiki Kaisha: *See*—
Koide, Tsuyoshi; and Maruyama, Toshio, 4,530,187, Cl. 51-165.870.
Toyoda, Shuhei; Yokoya, Yuji; and Ishii, Hakumi, to Toyota Jidosha Kabushiki Kaisha. Fastening device for tiltable steering assembly. 4,530,254, Cl. 74-493.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Donomoto, Tadashi; Tatematsu, Yoshiaki; and Tanaka, Atsuo, 4,530,875, Cl. 428-283.000.
Ikemoto, Kazuhito; Terakura, Yukio; and Miyake, Takashi, 4,530,253, Cl. 74-440.000.
Kanda, Mutsumi; Matsushita, Souichi; and Nakanishi, Kiyoshi, 4,530,312, Cl. 123-41.350.
Toyoda, Shuhei; Yokoya, Yuji; and Ishii, Hakumi, 4,530,254, Cl. 74-493.000.
Toyota Jidoshakogyo Kabushiki Kaisha: *See*—
Akagi, Motonobu; Kawabata, Yasuhiro; and Hattori, Kyo, 4,530,374, Cl. 137-625.300.
Toyota, Koji: *See*—
Yamada, Takemi; Satoh, Tamataro; Mizushina, Masaaki; Toyota, Koji; and Okamoto, Hiromi, 4,530,322, Cl. 123-188.0AA.
Transconsultants AB: *See*—
Igielska, Jadwiga, 4,530,628, Cl. 410-40.000.
Transformation Union Aktiengesellschaft: *See*—
Brandes, Donald, 4,531,108, Cl. 336-5.000.
Traugott, Tom D.: *See*—
Koster, Robert A.; and Traugott, Tom D., 4,530,973, Cl. 525-310.000.
Tricil Limited: *See*—
Guilford, Nigel G. H.; and Cadotte, Alan P., 4,530,292, Cl. 110-346.000.
Trimble, Currillies. Cricket switch. 4,531,029, Cl. 200-61.620.

Triplett, James T. Walk-in globe. 4,530,666, Cl. 434-141.000.
Triumph-Adler Aktiengesellschaft fur Buro- und Informationstechnik: *See*—
Engemann, Detlef; Fischer, Dieter; and Kleeberg, Heinz, 4,531,062, Cl. 250-578.000.
Horman, Richard; and Rettke, Wilfried, 4,530,613, Cl. 400-708.000.
Trop, Moshe, to Ben-Gurion University of the Negev Research and Development Authority. Powdered compositions and process for the manufacture of non-gelled acidified milk product drinks. 4,530,850, Cl. 426-584.000.
Trujillo, Stephen M.: *See*—
Perkins, Roger G.; and Trujillo, Stephen M., 4,530,812, Cl. 376-142.000.
Trutzschler GmbH & Co. Kg: *See*—
Hosel, Fritz, 4,530,134, Cl. 19-105.000.
TRW Inc.: *See*—
Shoup, Thomas E.; Maykut, Dennis J.; and Eagar, Thomas W., 4,531,042, Cl. 219-99.000.
Tsuchida, Eishun: *See*—
Matsushita, Yoh-ichi; Hasegawa, Etsuo; Eshima, Kiyoshi; and Tsuchida, Eishun, 4,530,794, Cl. 260-245.910.
Tsuchiya, Hiroaki: *See*—
Ueno, Ryuzo; Tsuchiya, Hiroaki; and Itoh, Shigeru, 4,530,724, Cl. 106-288.00Q.
Tsuda, Yoshio: *See*—
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,530,926, Cl. 514-214.000.
Tsudakoma Kogyo Kabushiki Kaisha: *See*—
Takegawa, Yujiro, 4,530,381, Cl. 139-452.000.
Tsukamoto, Goro: *See*—
Uno, Toshio; Takamatsu, Masanori; Iuchi, Koji; and Tsukamoto, Goro, 4,530,930, Cl. 514-312.000.
Tsuneno, Tatsuro: *See*—
Nakano, Takaharu; Mochizuki, Akihiro; Nakazato, Morikuni; and Tsuneno, Tatsuro, 4,530,771, Cl. 252-49.600.
Tsutsumi, Yoshio: *See*—
Ohta, Tomozo; Tsutsumi, Yoshio; and Sugano, Motoshi, 4,531,148, Cl. 358-21.00R.
Tunac, Josefino B.: *See*—
Bunge, Richard H.; French, James C.; Hurley, Timothy R.; Smitka, Tim A.; and Tunac, Josefino B., 4,530,835, Cl. 424-117.000.
Tungsram Rt.: *See*—
Nagy, Janos; and Oldal, Endre, 4,531,074, Cl. 313-331.000.
Turiot, Andre: *See*—
Veaux, Jacques; and Turiot, Andre, 4,530,425, Cl. 188-299.000.
Turner, Robert B.; Peffley, Richard D.; and Vanderhider, James A., to Dow Chemical Company, The. Reaction injection molded polyurethanes employing high molecular weight polyols. 4,530,941, Cl. 521-176.000.
Turunen, Olli: *See*—
Selin, Johan-Fredrik; Huttunen, Jouko; Turunen, Olli; Fors, Jan; Eklund, Vidar; and Ekman, Kurt, 4,530,999, Cl. 536-30.000.
Turznik, Gerhard: *See*—
Woerner, Frank P.; Reimann, Horst; Mahnke, Harald; Neumann, Peter; Turznik, Gerhard; and Kaeppel, Hanshelmut, 4,530,940, Cl. 521-124.000.
Tuscher, Otto: *See*—
Wolf, Dietmar; and Tuscher, Otto, 4,530,740, Cl. 204-9.000.
Tutco, Inc.: *See*—
Sherrill, Jimmy L., 4,531,017, Cl. 174-138.00J.
Tuurna, Sami A. E. Sled with a board-sailing rig. 4,530,300, Cl. 114-43.000.
Tyler, Derek E.: *See*—
Yarwood, John C.; and Tyler, Derek E., 4,530,394, Cl. 164-467.000.
Tyler, Glenn A., to Rockwell International Corporation. Azimuthally polarized beam quality improvement system. 4,531,216, Cl. 372-9.000.
Tyree, Christopher W.; and Poland, John M. Edge connector. 4,530,561, Cl. 339-134.000.
Uchida, Shigeru: *See*—
Nakayama, Takeshi; Kurosu, Masaaki; Ohshima, Yoshimitsu; Fujikata, Kenji; Uchida, Shigeru; and Nakajima, Akira, 4,531,119, Cl. 340-712.000.
Ueda, Hiroshi; and Mima, Yujiro. Telescopic extender for supporting compact camera. 4,530,580, Cl. 354-82.000.
Ueno, Ryuzo; Tsuchiya, Hiroaki; and Itoh, Shigeru, to Kabushiki Kaisha Ueno Seiyaku Uno Kenkyujo. Azo pigments derived from 2-hydroxynaphthalene-3-carboxylic acid or its salts having improved color. 4,530,724, Cl. 106-288.00Q.
Ugelstad, John; and Berge, Arvid, to Sintef. Process for the preparation of aqueous dispersions of organic material and possible further conversion to a polymer dispersion when the organic material is a polymerizable monomer. 4,530,956, Cl. 524-458.000.
Uhland, Joseph C. Game monitoring apparatus. 4,531,187, Cl. 364-412.000.
Uke, Alan K. Diver's flashlight. 4,531,178, Cl. 362-158.000.
Umezawa, Hamao; Takeuchi, Tomio; Ishizuka, Masaaki; Takita, Tomohisa; Shimada, Nobuyoshi; and Kato, Kuniki, to Zaidan Hojin Biseibutsu Kagaku KenkyuKai. 2'-Deoxyoxanosine. 4,530,998, Cl. 536-24.000.
Unger, Kim N.: *See*—
Tibbals, Rory L.; and Unger, Kim N., 4,530,758, Cl. 209-166.000.
Unifoam AG: *See*—
Vreenegoor, Nicholas C., 4,530,807, Cl. 264-51.000.
Union Oil Company of California: *See*—
Deering, Roland F.; Gowdy, Hugh W.; and Kelley, Arnold E., 4,530,752, Cl. 208-11.00R.
Hsieh, Wen-Ching; and Koepke, Jeffery W., 4,530,400, Cl. 166-273.000.
Union Siderurgique du Nord et de L'est de la France (Usinor): *See*—
Brun, Charles, 4,530,858, Cl. 427-320.000.
Union Special Corporation: *See*—
Adamski, Maximillian; Jenkins, David C.; and Kosrow, Robert L., 4,530,295, Cl. 112-121.120.
United Kingdom Atomic Energy Authority: *See*—
Parker, John A., 4,531,069, Cl. 307-492.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Restall, James E., 4,530,885, Cl. 428-670.000.
United States Gypsum Company: *See*—
Ishii, Yasuo, 4,530,653, Cl. 425-363.000.
United States of America
Agriculture: *See*—
McCabe, Dennis; and Soper, Richard S., 4,530,834, Cl. 424-93.000.
McGovern, Terrence P.; and Schreck, Carl E., 4,530,935, Cl. 514-613.000.
Air Force: *See*—
Pomphrey, Patrick J., Jr., 4,530,602, Cl. 356-138.000.
Shepherd, Freeman D., Jr.; Pellegrini, Paul W.; Ludington, Charlotte E.; and Weeks, Melanie M., 4,531,055, Cl. 250-211.00J.
Army: *See*—
Grinwald, Israel M., 4,530,411, Cl. 180-11.000.
Holder, James D., 4,531,076, Cl. 315-4.000.
Sayles, David C., 4,530,728, Cl. 149-19.600.
Energy: *See*—
Dagenhart, William K., 4,531,077, Cl. 315-111.810.
Gay, Don D.; and McMillan, William G., 4,530,250, Cl. 73-863.120.
Thompson, Larry D.; and Johnson, William R., Jr., 4,530,727, Cl. 148-2.000.
Health and Human Services: *See*—
Goldstein, Seth R.; and Jones, Robert, 4,530,698, Cl. 604-271.000.
Interior: *See*—
Cecala, Andrew B.; and Volkwein, Jon C., 4,530,112, Cl. 2-209.200.
Navy: *See*—
De Fusco, Albert A.; and Nielsen, Arnold T., 4,531,013, Cl. 564-428.000.
Lin, Samuel S., 4,531,196, Cl. 364-827.000.
Lin, Samuel S., 4,531,197, Cl. 364-827.000.
Mensa, Dean L.; and Moss, Dale C., 4,531,128, Cl. 343-18.00C.
Zell, Warren E.; Imel, Charles E.; Saam, Richard D.; Hearst, Peter J.; Olah, Nicholas J.; Bialecki, Adolph; and Biggers, Rececca L., 4,530,131, Cl. 15-321.000.
Transportation: *See*—
Kusenberger, Felix N.; Lozano, Albert S.; and Tarver, Wilson B., Jr., 4,531,091, Cl. 324-242.000.
U.S. Philips Corporation: *See*—
Chung, Kah-Seng; and Zegers, Leo E., 4,531,221, Cl. 375-60.000.
Gartner, Georg; and Gotje, Egbert B. G. W., 4,530,669, Cl. 445-51.000.
Sarges, Heidrun; Kommoss, Klaus; and Schutte, Valentin H., 4,530,252, Cl. 74-388.00R.
U.S. Plastic and Chemical Corp.: *See*—
Wowczuk, Andrew; and Pilesi, William D., 4,530,434, Cl. 209-588.000.
United States Surgical Corporation: *See*—
Green, David T., 4,530,453, Cl. 227-19.000.
United Technologies Corporation: *See*—
Sederquist, Richard A., 4,530,886, Cl. 429-13.000.
Torres, John R.; and Albano, Rocco V., 4,531,214, Cl. 371-66.000.
Walker, Bryant H., 4,530,229, Cl. 72-354.000.
Universal Foods Corporation: *See*—
Nagodawithana, Tilak; and Gutmanis, Feliks, 4,530,846, Cl. 426-62.000.
Universite de Sherbrooke: *See*—
Godbout, Normand, 4,530,289, Cl. 110-117.000.
University of Medicine and Dentistry: *See*—
Desjardins, Paul J.; Menon, Sathischandran; Milles, Maano; and Pawel, Hans E., 4,530,367, Cl. 128-777.000.
Uno, Fumio, to Unolab Co., Ltd. Peristaltic pump having conical rollers. 4,530,647, Cl. 417-477.000.
Uno, Toshio; Takamatsu, Masanori; Iuchi, Koji; and Tsukamoto, Goro, to Kanebo, Ltd. Antimicrobial 1-ethyl-6,8-difluoro-1,4-dihydro-7-(1-imidazolyl)-4-oxoquinoline-3-carboxylic acid derivatives. 4,530,930, Cl. 514-312.000.
Unolab Co., Ltd.: *See*—
Uno, Fumio, 4,530,647, Cl. 417-477.000.
Upjohn Company, The: *See*—
Huber, Joel E., 4,530,795, Cl. 260-397.400.
Kurtz, Richard R., 4,531,004, Cl. 548-112.000.
Nelson, Stephen J., 4,531,006, Cl. 549-7.000.
Ure, David G.: *See*—
Wigan, Jack S.; Ure, David G.; and Richards, John M., 4,531,184, Cl. 364-200.000.

Urmossy, Miklos: *See*—
Czegledi, Bela; Csovari, Mihaly; Erdelyi, Miklos; Illi, Jozsef; Stocker, Lajos; Szoke, Attila; Szabo nee Mogyorosi, Katalin; Riederauer, Szilard; Urmossy, Miklos; Terenyi, Gyula; and Csurgai, Istvan, 4,530,819, Cl. 423-112.000.

Usui, Takeshi, to NEC Corporation. Optical receiver having collision detection function. 4,531,239, Cl. 455-607.000.

USV Pharmaceutical Corp.: *See*—
Musser, John H.; and Sutherland, Charles A., 4,530,931, Cl. 514-312.000.

Vachon, Louis F., to Caterpillar Tractor Co. Unitary removal of engine cylinder liner, piston and rod. 4,530,141, Cl. 29-156.4WL.

Vale, Wylie W., Jr.: *See*—
Evans, Ronald M.; Swanson, Larry; Vale, Wylie W., Jr.; Rosenfeld, Michael G.; Amara, Susan G.; Brown, Marvin R.; and Rivier, Jean E. F., 4,530,838, Cl. 514-11.000.

Valyocsik, Ernest W., to Mobil Oil Corporation. Organic template for synthesis of ZSM-23 zeolite. 4,531,012, Cl. 564-295.000.

Van Chuong, Paul P.: *See*—
Charon, Marie-Helene; Fromageot, Pierre; and Van Chuong, Paul P., 4,530,837, Cl. 514-18.000.

van den Berg, Arie P., to Ingenieursbureau A. P. Van den Berg B.V. Soil investigation device. 4,530,236, Cl. 73-84.000.

van de Pas, Johannes C.; van Voorst Vader, Frederik; and Toet, Wilhelmina K., to Lever Brothers Company. Liquid detergent composition containing stabilizing electrolyte mixtures. 4,530,780, Cl. 252-528.000.

Vanderhider, James A.: *See*—
Turner, Robert B.; Peffley, Richard D.; and Vanderhider, James A., 4,530,941, Cl. 521-176.000.

Van Der Puy, Michael: *See*—
Kolc, Jaroslav F.; Swerdloff, Michael D.; Rogic, Milorad M.; Hendrickson, Larry L.; and Van Der Puy, Michael, 4,530,714, Cl. 71-28.000.

Vanderschel, David J., to Schlumberger Technology Corporation. Computerized truck instrumentation system. 4,531,204, Cl. 367-25.000.

Van Holten, Theodoor, to Stichting Energieonderzoek Centrum Nederland. Device for deriving energy from a flowing medium. 4,530,644, Cl. 416-175.000.

Van Rietschoten, Henk: *See*—
Lee, Frank X.; Krimsky, Leonard C.; and Van Rietschoten, Henk, 4,530,265, Cl. 83-337.000.

van Voorst Vader, Frederik: *See*—
van de Pas, Johannes C.; van Voorst Vader, Frederik; and Toet, Wilhelmina K., 4,530,780, Cl. 252-528.000.

Varian Associates, Inc.: *See*—
Evans, Steven J.; and Symons, Robert S., 4,531,103, Cl. 331-83.000.

Vasta, Joseph A., to Du Pont de Nemours, E. I., and Company. Ester curing agent for fluorocarbon polymer coating composition. 4,531,010, Cl. 560-125.000.

Vastag, Harold J.: *See*—
Ellsworth, Carroll V.; Schultz, Fredrick W.; and Vastag, Harold J., 4,530,214, Cl. 62-71.000.

Vaw Leichtmetall GmbH: *See*—
Bergheim, Hans; and Griep, Winfried, 4,530,145, Cl. 29-458.000.

VDO Adolf Schindling AG: *See*—
Mann, Arnold; Ruschek, Gerhard; and Zenker, Reinhard, 4,530,326, Cl. 123-342.000.

Veaux, Jacques; and Turiot, Andre, to Messier-Hispano-Bugatti (S.A.). Shock absorber. 4,530,425, Cl. 188-299.000.

Veb Kombinat Polygraph "Werner Lamberz" Leipzig: *See*—
Zimmermann, Hans; Pieper, Fritz; and Nagel, Hartmut, 4,530,495, Cl. 271-204.000.

Velsher, Benne; Hvezda, Jaroslav M.; and Middlehurst, Richard J., to Northern Telecom Limited. High density low profile multiple contact connector. 4,530,554, Cl. 339-17.00M.

Ventura, Robert M. Wrench assembly for use with mine wall support bolts. 4,530,261, Cl. 81-177.0UJ.

Verdenne, Jean, to Societe Nouvelle Terseram-Megras. Small size stamping device. 4,530,281, Cl. 101-104.000.

Vere , Bernard; Biryoukoff, Maura; and Mathevon, Paul, to Cogema and Framatome. Process and apparatus for assembling the strips of a grille. 4,530,146, Cl. 29-468.000.

Verhulst, Michael J.: *See*—
Vogt, James L.; and Verhulst, Michael J., 4,531,027, Cl. 200-6.00A.

Versace, Richard W.: *See*—
Girijavallabhan, Viyyoor M.; Ganguly, Ashit K.; Pinto, Patrick A.; and Versace, Richard W., 4,530,793, Cl. 260-245.20R.

Versatile Corporation: *See*—
Stiff, Rodney A.; and Baker, Malcolm J., 4,530,293, Cl. 111-2.000.

Vickers plc: *See*—
Boyes, Adrian P., 4,530,384, Cl. 141-95.000.

Vickery, Brian H.: *See*—
Nestor, John J.; and Vickery, Brian H., 4,530,920, Cl. 514-15.000.

Vico Kemisk Tekniska Fabrik AB: *See*—
Tiedemann, Wolfgang O., 4,530,165, Cl. 34-32.000.

Victor Company of Japan: *See*—
Takubo, Takayuki; and Otake, Yoshichi, 4,531,159, Cl. 358-229.000.

Victor Company of Japan, Limited: *See*—
Ishigaki, Yukinobu; and Hirohashi, Kazutoshi, 4,531,095, Cl. 328-165.000.
Tokumitsu, Junsuke, 4,531,162, Cl. 360-10.300.

Vielmo, Paolo; Brighenti, Attilio; and Blandino Alamia, Antonio. System for recovering wave energy and its conversion into useful energy. 4,531,063, Cl. 290-53.000.

Vitrac, Jean-Pierre, to Stereoscopes Lestrade & Cie., S.A. Transparency viewer. 4,530,570, Cl. 350-241.000.

Vives, Charles, to Aluminium Pechiney. Process for the electromagnetic casting of metals involving the use of at least one magnetic field which differs from the field of confinement. 4,530,404, Cl. 164-467.000.

Vlach, Jiri: *See*—
Gruber, Gerhard; Moser, Peter; Conrad, Ulrich; and Vlach, Jiri, 4,530,682, Cl. 474-133.000.

Vogel, William M., Jr.; Weingardt, Rolf E.; O'Guin, Waco J.; and Littenberg, Joseph S., to Standard Container Company. Plastic container and sealing ring assembly therefor. 4,530,442, Cl. 220-354.000.

Vogt, James L.; and Verhulst, Michael J., to Deere & Company. "Joystick" and rocker switch control mechanism. 4,531,027, Cl. 200-6.00A.

Volkwein, Jon C.: *See*—
Cecala, Andrew B.; and Volkwein, Jon C., 4,530,112, Cl. 2-209.200.

Von Roll AG: *See*—
Nyffeler, Heinz; and Banholzer, Guido, 4,530,521, Cl. 285-21.000.
Nyffeler, Heniz; and Buri, Rudolf, 4,530,520, Cl. 285-21.000.

Vonderwahl, Rodolphe: *See*—
Polony, Rudolf; Reinert, Gerhard; Holzle, Gerd; Pugin, Andre ; and Vonderwahl, Rodolphe, 4,530,924, Cl. 514-191.000.

Von Schwerdtner, Otto; Gossen, Hans; Gunther, Jurgen; and Peters, Hans, to Kraftwerk Union Aktiengesellschaft. Turbine condenser with at least one bypass steam inlet leading into the steam dome. 4,530,212, Cl. 60-657.000.

Vornberger, George F., to Senco Products, Inc. Piston and driver. 4,530,455, Cl. 227-130.000.

Voss, Roy N.; and Peplow, Marvin J., to Ideal Industries, Inc. Wire marker dispenser. 4,530,472, Cl. 242-55.300.

Vreenegoor, Nicholas C., to Unifoam AG. Production of polymeric foam. 4,530,807, Cl. 264-51.000.

Wacker-Chemie GmbH: *See*—
Michel, Ulrich; and Radecker, Josef, 4,530,989, Cl. 528-15.000.

Wagner, Richard C., to Hollymatic Corporation. Meat loaf forming apparatus. 4,530,132, Cl. 17-45.000.

Wakasa, Akinori, to Mazda Motor Corporation. Cylinder head structure of engine. 4,530,323, Cl. 123-41.770.

Walberg, Arvid C.: *See*—
Lyons, Robert E.; and Walberg, Arvid C., 4,530,274, Cl. 98-115.200.

Walk Off Mats Limited: *See*—
Brazier, Peter C., 4,530,870, Cl. 428-95.000.

Walker, Bryant H., to United Technologies Corporation. Forging method and die package therefor. 4,530,229, Cl. 72-354.000.

Walker, James D., to Sperry Corporation. Breakaway mechanism for a twine wrapping apparatus. 4,530,279, Cl. 100-5.000.

Walker, Kenneth L.; and Farnstrom, Kenneth A., to Remote Technology Corp. Releasable connector for conduit components. 4,530,522, Cl. 285-91.000.

Wallis, Christopher J.: *See*—
Collington, Eric W.; Hallett, Peter; Wallis, Christopher J.; and Bradshaw, John, 4,530,925, Cl. 514-211.000.

Walum, Erik: *See*—
Peterson, Anders; and Walum, Erik, 4,530,907, Cl. 435-240.000.

Wang, Chia-Lin J., to Du Pont de Nemours, E. I., and Company. 8-Aza-13-thiaprostanoids and a method of use thereof as anti-ulcer agents. 4,530,933, Cl. 514-425.000.

Warner, Bert J.: *See*—
Cullick, Alvin S.; and Warner, Bert J., 4,530,234, Cl. 73-53.000.

Warner-Lambert Company: *See*—
Bunge, Richard H.; French, James C.; Hurley, Timothy R.; Smitka, Tim A.; and Tunac, Josefino B., 4,530,835, Cl. 424-117.000.
Butler, Donald E.; Pavia, Michael R.; and Hershenson, Fred M., 4,530,929, Cl. 514-295.000.
Smerbeck, Richard V.; and Pittz, Eugene P., 4,530,844, Cl. 514-458.000.

Washecheck, Don M.: *See*—
Ryan, Robert C.; Adams, Charles T.; and Washecheck, Don M., 4,530,911, Cl. 502-74.000.

Watanabe, Isamu: *See*—
Nakayama, Masahito; Iwasaki, Akio; Kimura, Shigeru; Tanabe, Sohei; Mizoguchi, Toshimi; Murakami, Akira; Watanabe, Isamu; Okuchi, Masao; Ito, Hisakatsu; and Mori, Toshihito, 4,530,791, Cl. 260-245.20T.

Watanabe, Kenji, to Sony Corporation. Method and apparatus for encoding and decoding a binary digital information signal. 4,531,153, Cl. 358-141.000.

Watanabe, Shigeyoshi; and Tanaka, Sumio, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor nonvolatile read only memory device. 4,531,202, Cl. 365-104.000.

Watashi, Masahiro: *See*—
Kimura, Hiroshi; Hisajima, Masahiko; Shibata, Kiyoshi; Irie, Yoichiro; Morimoto, Kiyoshi; Nagashima, Takashi; Yoshikawa, Yasuhiko; Watashi, Masahiro; Yamamoto, Kiyonori; Yamamoto, Toshihiko; and Yoshinaga, Shinsuke, 4,530,588, Cl. 355-3.0DR.

Waters, Donald D.: *See*—
Beaver, Richard N.; Evans, Kenneth R.; and Waters, Donald D., 4,530,749, Cl. 204-296.000.

Waters, George F., to Codman & Shurtleff, Inc. Mounting assembly for synchronized adjustment of multiple microscope housing. 4,530,577, Cl. 350-513.000.

Waterworth, Philip D.: *See—*
Powell, Roger M.; Marshall, Steven; and Waterworth, Philip D., 4,530,202, Cl. 53-426.000.

Wauters, Ronald P.: *See—*
Bannon, Glen M.; Hardie-Muncy, Darlene A.; and Wauters, Ronald P., 4,530,848, Cl. 426-293.000.

Weaver, Max A.; and Giles, Ralph R., to Eastman Kodak Company. Azo dyes from sulfonated 3-sulfonated 3-amino-2,1-benzisothiazoles with 1,2,3,4-tetrahydroquinoline or 2,3-dihydro-1,4-benzoxazine couplers. 4,530,997, Cl. 534-768.000.

Weaver, Robert F.; and Proctor, Ted G., to Emhart Industries, Inc. Shaded pole synchronous motor. 4,531,072, Cl. 310-162.000.

Webasto-Werk W. Baier GmbH & Co.: *See—*
Panick, Karl, 4,530,658, Cl. 431-329.000.

Wechselberger, Anthony J.; Bluestein, Leo I.; Jedynak, Leo; Drake, David A.; and Simpson, Larry W., to Oak Industries Inc. Multi-layer encryption system for the broadcast of encrypted information. 4,531,020, Cl. 178-22.080.

Wechsler, Joseph W. Derailer mechanism. 4,530,678, Cl. 474-81.000.

Weeks, Melanie M.: *See—*
Shepherd, Freeman D., Jr.; Pellegrini, Paul W.; Ludington, Charlotte E.; and Weeks, Melanie M., 4,531,055, Cl. 250-211.00J.

Weeks, Paul D., to Pfizer Inc. Process and intermediates for preparation of 1,1-dioxopenicillanoyloxymethyl 6-beta-aminopenicillanate. 4,530,792, Cl. 260-245.20R.

Weid, Manfred: *See—*
Altemark, Detlef; Sommers, Hans; and Weid, Manfred, 4,530,656, Cl. 431-8.000.

Weidler, Charles H., to AMP Incorporated. Plug and socket connector for terminating small gauge magnet wire. 4,530,560, Cl. 339-97.00R.

Weil, Max H.: *See—*
Bisera, Jose; and Weil, Max H., 4,530,696, Cl. 604-253.000.

Weiler, Rolf; Kretzer, Horst; Leidecker, Hans-Dieter; and Gerhardt, Winfried, to ITT Industries, Inc. Sealing cap for cylindrical parts, especially for a bolt guide of a spot-type disk brake. 4,530,506, Cl. 277-212.0FB.

Weinberg, Joshua. Attachment adapted for use with different necklaces. 4,530,221, Cl. 63-2.000.

Weingardt, Rolf E.: *See—*
Vogel, William M., Jr.; Weingardt, Rolf E.; O'Guin, Waco J.; and Littenberg, Joseph S., 4,530,442, Cl. 220-354.000.

Weis, Siegfried K.: *See—*
Jasperse, Philip D.; Weis, Siegfried K.; and Sovis, Milo D., Jr., 4,530,609, Cl. 384-482.000.

Weiss, Karyn: *See—*
Mednick, Mel; and Weiss, Karyn, 4,530,671, Cl. 446-320.000.

Weiss, Robert A.; Lundberg, Robert D.; and Werner, Allen C., to Exxon Research and Engineering Co. Elastomeric sulfonate terpolymers and process for forming the sulfonated terpolymers. 4,530,986, Cl. 526-240.000.

Weissmann, Charles, to Biogen N.V. Recombinant DNA molecules and their use in producing human interferon-like polypeptides. 4,530,901, Cl. 435-70.000.

Welborn, Howard C., Jr.: *See—*
Ewen, John A.; and Welborn, Howard C., Jr., 4,530,914, Cl. 502-113.000.

Weld, Greg: *See—*
Spiegel, Martin A.; and Weld, Greg, 4,530,542, Cl. 301-37.00R.

Wellman, Brian. Portable, weathertight document storage and visible display device. 4,530,175, Cl. 40-10.00B.

Wells, Wesley G.: *See—*
Corley, John E.; Andert, Charles M.; Geen, Joseph H.; Wells, Wesley G.; and Lark, Russell D., 4,530,625, Cl. 408-14.000.

Werber, Gerhardt P., to Eschem Inc. Anaerobic adhesives. 4,530,988, Cl. 526-270.000.

Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See—*
Kotthaus, Erich, 4,530,623, Cl. 407-22.000.

Werner, Allen C.: *See—*
Weiss, Robert A.; Lundberg, Robert D.; and Werner, Allen C., 4,530,986, Cl. 526-240.000.

Wesner, Walter H.: *See—*
Saulson, Stanley H.; and Wesner, Walter H., 4,530,368, Cl. 128-784.000.

Wess, Othmar: *See—*
Forsmann, Bernd; Wess, Othmar; Zech, Hendrik; and Chaussy, Christian, 4,530,358, Cl. 128-328.000.

West Electric Co., Ltd.: *See—*
Ishikawa, Katsuji, 4,531,157, Cl. 358-227.000.

Westinghouse Electric Corp.: *See—*
Freeman, Willie B.; and Span, Richard M., 4,531,031, Cl. 200-82.00B.
Johnson, Gerald D.; and Powell, Roger W., 4,530,719, Cl. 75-124.000.
Kuhn, Earl C., 4,531,070, Cl. 310-56.000.
Randall, Charles E., 4,530,189, Cl. 52-30.000.
Ritter, Catharine A., 4,530,138, Cl. 29-25.350.
Sagmuller, Joseph, 4,531,051, Cl. 235-1.00C.
Smeltzer, Eugene E.; and Skriba, Michael C., 4,530,723, Cl. 106-90.000.

Westlake, David J.: *See—*
Gregory, Reginald; and Westlake, David J., 4,531,014, Cl. 585-415.000.

Weyerhaeuser Company: *See—*
Hinton, Gordon L., 4,530,460, Cl. 229-27.000.

Weyrich, Claus; Ziegler, Guenther; Hoffmann, Ludwig; and Theis, Dietmar, to Siemens Aktiengesellschaft. Light emitting diode having silicon carbide layers. 4,531,142, Cl. 357-17.000.

Wharff, Prentice C.: *See—*
Kuhlemann, Bruce N.; Horvath, Kalman; and Wharff, Prentice C., 4,530,697, Cl. 604-263.000.

Whatley, David L.; and Chaviers, Wallace M., to Hydraunit Venture. Oil well pumping apparatus. 4,530,645, Cl. 417-399.000.

Wheeler, William C.: *See—*
Herz, Harold L.; Jobes, Sam S.; Jordan, John D.; Benfey, David P.; and Wheeler, William C., 4,531,181, Cl. 363-21.000.

Whipple, Andrew: *See—*
Clyde, Robert A.; and Whipple, Andrew, 4,530,763, Cl. 210-610.000.

Whirlpool Corporation: *See—*
Janke, Donald E.; and Linstromberg, William J., 4,530,218, Cl. 62-156.000.
Keane, James W., 4,530,543, Cl. 301-63.0PW.

White, Gregory S., to Deere & Co. Planter row marker. 4,530,405, Cl. 172-126.000.

White, Kenneth B., to Akzona Incorporated. Method for the manufacture of polyisocyanurate foams. 4,530,937, Cl. 521-105.000.

White, Kenneth B., to Akzona Incorporated. Polyols for urethane-modified isocyanurate foams. 4,530,938, Cl. 521-105.000.

Whitehurst Associates, Inc.: *See—*
Whitehurst, Brooks M.; Clemens, Donald F.; King, Taylor; and Whitehurst, Garnett B., 4,530,735, Cl. 156-642.000.

Whitehurst, Brooks M.; Clemens, Donald F.; King, Taylor; and Whitehurst, Garnett B., to Whitehurst Associates, Inc.; and Encee Chemical Sales, Inc., a part interest. Wet-process phosphoric acid brightening reagent for aluminum. 4,530,735, Cl. 156-642.000.

Whitehurst, Garnett B.: *See—*
Whitehurst, Brooks M.; Clemens, Donald F.; King, Taylor; and Whitehurst, Garnett B., 4,530,735, Cl. 156-642.000.

Whitley, Lawrence D., to International Business Machines Corporation. Indexed-indirect addressing using prefix codes. 4,531,200, Cl. 364-900.000.

Whitlock, Jonathan B.; and Drzala, Christopher W., to GK Technologies, Incorporated. Digital phase lock loop system. 4,531,102, Cl. 331-1.00A.

Whitney, Ralph H.: *See—*
Gray, Thomas W.; and Whitney, Ralph H., 4,530,437, Cl. 215-252.000.

Wickes Corporation, The: *See—*
Hotovy, James R., 4,530,167, Cl. 34-47.000.

Wide-Lite International, Inc.: *See—*
Hernandez, Jose A., 4,531,180, Cl. 362-297.000.

Widmaier, Horst: *See—*
Schmid, Theobald; Widmaier, Horst; and Wolf, Friedrich, 4,531,033, Cl. 200-314.000.

Wiech, Raymond E., Jr., to Fine Particle Technology Corporation. Method of fabricating complex micro-circuit boards and substrates and substrate. 4,531,145, Cl. 357-81.000.

Wiedemann, Wolfgang, to Hoechst Aktiengesellschaft. Electrophotographic recording material for printing forms. 4,530,892, Cl. 430-78.000.

Wiedmer, Walter. Screw cap with guarantee strip for container. 4,530,436, Cl. 215-246.000.

Wienand, Henning: *See—*
Ostertag, Werner; Dimroth, Peter; Wienand, Henning; Liedek, Egon; Knittel, Helmut; and Etzrodt, Gunter, 4,530,725, Cl. 106-298.000.

Wigan, Jack S.; Ure, David G.; and Richards, John M., to Reuters, Ltd. Conversational video system having contact selection control. 4,531,184, Cl. 364-200.000.

Wilkins, Tracy D.; and Sullivan, Nadine M. Toxins and antibodies of *C. difficile*. 4,530,833, Cl. 424-92.000.

Wilkinson, Philip J., to NCR Corporation. Method and apparatus for thermally printing data in special fonts on documents like checks. 4,531,132, Cl. 346-76.0PH.

Willards Foods Limited: *See—*
Stanley, Haydn T.; and Drake, Derek J., 4,530,849, Cl. 426-439.000.

Wm. R. Stewart & Sons (Hacklemakers) Ltd.: *See—*
Stewart, William R.; Stewart, David B.; and Dickinson, John M. C., 4,530,133, Cl. 19-97.000.

Williams, Charles R.: *See—*
Yonker, John H.; Williams, Charles R.; and Granhaug, Otto J., 4,530,485, Cl. 251-93.000.

Williams, Donald H., to Consolidated Papers, Inc. Apparatus for opening folded corrugated cartons. 4,530,692, Cl. 493-309.000.

Williams, Graham: *See—*
Pawloski, James A.; Williams, Graham; and Pawloski, James A., Jr., 4,530,357, Cl. 128-312.000.

Williams, Ian G., to Imperial Chemical Industries PLC. Flame retardant polyamide compositions. 4,530,951, Cl. 524-101.000.

Williams, James H., to Borden, Inc. Urea-formaldehyde fertilizer suspensions. 4,530,713, Cl. 71-28.000.

Williams, James N. Lifting tongs. 4,530,536, Cl. 294-118.000.

Williamson, Michael, to Owens-Corning Fiberglas Corporation. Glass melting furnace. 4,531,218, Cl. 373-39.000.

Wilson, David; and Reverter, John A., to Ciba-Geigy Corporation. Water treatment composition comprising a hydrolyzed maleic anhydride copolymer and a zinc compound. 4,530,955, Cl. 524-434.000.

Wilson, James D.; and Miles, Malcolm G., to Monsanto Company. Subvalent halide compounds tetraselenofulvalene and tetrathiofulvalene subvalent halides. 4,530,789, Cl. 260-239.00R.

Wink, Randall: *See*—
Fuchs, Gilbert; Crowley, Norman; and Wink, Randall, 4,530,729, Cl. 156-217.000.
Winters, Giorgio; and Sala, Alberto, to Gruppo Lepetit S.p.A. Antiinflammatory and anxiolytic isoxazole-[5,4-b]pyridines. 4,530,927, Cl. 514-215.000.
Woerner, Frank P.; Reimann, Horst; Mahnke, Harald; Neumann, Peter; Turznik, Gerhard; and Kaeppel, Hanshelmut, to BASF Aktiengesellschaft. Stabilized melamine resin foams. 4,530,940, Cl. 521-124.000.
Wojtowicz, Edward A.: *See*—
Rau, William G.; and Wojtowicz, Edward A., 4,530,269, Cl. 89-1.140.
Wolf, Dietmar; and Tuscher, Otto, to Messerschmitt-Bolkow-Blohm GmbH. Method of producing closed canals in components such as heat exchangers and rocket combustion chamber walls. 4,530,740, Cl. 204-9.000.
Wolf, Friedrich: *See*—
Schmid, Theobald; Widmaier, Horst; and Wolf, Friedrich, 4,531,033, Cl. 200-314.000.
Wolfe, Sidney N.: *See*—
Shaked, Ze'ev; and Wolfe, Sidney N., 4,530,787, Cl. 260-112.00R.
Wolkstein, Herbert J., to RCA Corporation. Optoelectronic multiposition RF signal switch. 4,530,573, Cl. 350-358.000.
Wolter, Manfred; Dorn, Friedrich-Wilhelm; Heymer, Gero; and Stephan, Hans-Werner, to Hoechst Aktiengesellschaft. Process for separating carbon black from an aqueous suspension. 4,530,769, Cl. 210-769.000.
Wong, Boon; Morel, Don L.; and Grosvenor, Victor L., to Atlantic Richfield Company. PIN Amorphous silicon solar cell with nitrogen compensation. 4,531,015, Cl. 136-258.000.
Wooten, Thomas P., to International Playtex, Inc. Adjustable brassiere. 4,530,361, Cl. 128-483.000.
Worldwide Converting Machinery, Inc.: *See*—
Lee, Frank X.; Krimsky, Leonard C.; and Van Rietschoten, Henk, 4,530,265, Cl. 83-337.000.
Wowczuk, Andrew; and Pilesi, William D., to U.S. Plastic and Chemical Corp. Method and apparatus for the inspection and separation of symmetrical stable units. 4,530,434, Cl. 209-588.000.
Wright, Kenton B., to Aluminum Company of America. Temperature measurement technique. 4,530,659, Cl. 432-32.000.
Wright, Ralph W.: *See*—
Kauffman, William J.; and Wright, Ralph W., 4,530,856, Cl. 427-197.000.
Wyatt, John G.: *See*—
Ashley, Michael J.; Greaves, Roy A.; and Wyatt, John G., 4,530,822, Cl. 423-242.000.
Wysk, Stanley R., to Combustion Engineering, Inc. Separating spent and unreacted particles of calcium-based sulfur sorbent. 4,530,291, Cl. 110-342.000.
Xerox Corporation: *See*—
Adams, John N., 4,530,589, Cl. 355-3.00R.
Badesh, Santokh B., 4,530,718, Cl. 75-121.000.
Drews, Reinhold E.; Fisher, Almon P.; Hermanson, Herman A.; and Pond, Stephen F., 4,531,137, Cl. 346-74.400.
Green, Frederick A.; and Seedhouse, Frederick A., 4,530,592, Cl. 355-11.000.
Rawson, Eric G.; Murray, Hallam G.; Schmidt, Ronald V.; and Stewart, Lawrence C., 4,531,238, Cl. 455-601.000.
Scifres, Donald R.; and Sprague, Robert A., 4,530,574, Cl. 350-420.000.
Yagasaki, Toshiaki: *See*—
Kasuya, Yukio; Yagasaki, Toshiaki; and Masuda, Shunichi, 4,530,593, Cl. 355-14.00R.
Yale University: *See*—
Labowsky, Michael J.; Fenn, John B.; and Yamashita, Masamichi, 4,531,056, Cl. 250-288.000.
Yalpani, Manssur, to British Columbia Research Council. Processes for the preparation of branched, water soluble cellulose products. 4,531,000, Cl. 536-30.000.
Yamada, Noriyuki, to Motorola, Inc. Protective power foldback circuit for a power semiconductor. 4,531,173, Cl. 361-86.000.
Yamada, Takemi; Satoh, Tamataro; Mizushina, Masaaki; Toyota, Koji; and Okamoto, Hiromi, to Nippon Kokan Kabushiki Kaisha. Exhaust valve for diesel engine and production thereof. 4,530,322, Cl. 123-188.0AA.
Yamada, Yasuyuki, to Canon Kabushiki Kaisha. Display device for view finder. 4,530,583, Cl. 354-224.000.
Yamaguchi, Hirotsugu: *See*—
Fukino, Masato; Yanai, Tokiyoshi; Yamaguchi, Hirotsugu; and Aoyama, Yutaka, 4,530,414, Cl. 180-142.000.
Yamaguchi, Yasuyuki: *See*—
Takagi, Kazumasa; and Yamaguchi, Yasuyuki, 4,531,116, Cl. 340-568.000.
Yamakawa, Kazuo, to Minolta Camera Kabushiki Kaisha. Video projector lens system. 4,530,575, Cl. 350-432.000.
Yamamori, Hisayoshi: *See*—
Shindo, Mizuo; Yamamoto, Takashi; Fukunaga, Osamu; and Yamamori, Hisayoshi, 4,530,809, Cl. 264-210.700.
Yamamoto, Kazushi; Nagai, Takeshi; Hirai, Nobuyuki; and Mori, Shunichiro, to Matsushita Electric Industrial Co., Ltd. Ultrasonic liquid ejecting unit and method for making same. 4,530,464, Cl. 239-102.000.
Yamamoto, Kiyonori: *See*—
Kimura, Hiroshi; Hisajima, Masahiko; Shibata, Kiyoshi; Irie, Yoichiro; Morimoto, Kiyoshi; Nagashima, Takashi; Yoshikawa, Yasuhiko; Watashi, Masahiro; Yamamoto, Kiyonori; Yamamoto, Toshihiko; and Yoshinaga, Shinsuke, 4,530,588, Cl. 355-3.0DR.
Yamamoto, Takashi: *See*—
Shindo, Mizuo; Yamamoto, Takashi; Fukunaga, Osamu; and Yamamori, Hisayoshi, 4,530,809, Cl. 264-210.700.
Yamamoto, Toshihiko: *See*—
Kimura, Hiroshi; Hisajima, Masahiko; Shibata, Kiyoshi; Irie, Yoichiro; Morimoto, Kiyoshi; Nagashima, Takashi; Yoshikawa, Yasuhiko; Watashi, Masahiro; Yamamoto, Kiyonori; Yamamoto, Toshihiko; and Yoshinaga, Shinsuke, 4,530,588, Cl. 355-3.0DR.
Yamane, Jimmie F. Bowling ball including thumb-hole insert. 4,530,502, Cl. 273-63.00A.
Yamashita, Masamichi: *See*—
Labowsky, Michael J.; Fenn, John B.; and Yamashita, Masamichi, 4,531,056, Cl. 250-288.000.
Yamauchi Rubber Industry Co., Ltd.: *See*—
Inaguma, Hideo, 4,530,866, Cl. 428-36.000.
Yamazaki, Ryutarou, to Honda Giken Kogyo K.K. Apparatus for controlling evaporated fuel in an internal combustion engine having a supercharger. 4,530,210, Cl. 60-605.000.
Yamazaki, Yoshio: *See*—
Kawamoto, Kiyoaki; Shukuri, Kastuhiro; Hashimoto, Takayoshi; Yamazaki, Yoshio; and Inowa, Shigeru, 4,530,596, Cl. 355-15.000.
Yamori, Akio: *See*—
Shiraki, Toshinori; Yamori, Akio; and Morita, Hideo, 4,530,966, Cl. 525-89.000.
Shiraki, Toshinori; Yamori, Akio; and Morita, Hideo, 4,530,967, Cl. 525-89.000.
Yanai, Tokiyoshi: *See*—
Fukino, Masato; Yanai, Tokiyoshi; Yamaguchi, Hirotsugu; and Aoyama, Yutaka, 4,530,414, Cl. 180-142.000.
Yanaihara, Noboru; Sugiura, Nobuo; and Kashimoto, Kazuhisa, to Amano Pharmaceutical Co., Ltd. Peptide. 4,530,836, Cl. 514-16.000.
Yang, Wei H. Windmill mechanism. 4,530,642, Cl. 416-119.000.
Yarwood, John C.; and Tyler, Derek E., to Olin Corporation. Controlled water application for electromagnetic casting shape control. 4,530,394, Cl. 164-467.000.
Yasuda, Hiroshi: *See*—
Kaneko, Nobuo; Takemoto, Takeshi; and Yasuda, Hiroshi, 4,530,280, Cl. 101-93.020.
Yasuda, Seiji: *See*—
Tanihara, Koichi; Tamai, Keiko; and Yasuda, Seiji, 4,530,768, Cl. 210-719.000.
Yasuda, Shinichiro: *See*—
Imamura, Tetsuya; Takeuchi, Takashi; Tetsutani, Takashi; and Yasuda, Shinichiro, 4,530,894, Cl. 430-106.600.
Yasuhara, Takeshi; and Nabeta, Eiichi, to Fuji Electric Company, Ltd. Measurement apparatus. 4,531,193, Cl. 364-551.000.
Yasui, Kazuomi: *See*—
Aya, Masahiro; Yasui, Kazuomi; and Kamochi, Atsumi, 4,530,717, Cl. 71-90.000.
Yasui, Shinichiro: *See*—
Tagami, Katsutoshi; Takahashi, Tsuneo; Yasui, Shinichiro; and Ichikawa, Akira, 4,531,123, Cl. 340-995.000.
Yokomizo, Yoshikazu, to Canon Kabushiki Kaisha. Data communication system. 4,531,240, Cl. 455-607.000.
Yokono, Hitoshi: *See*—
Azuma, Kazufumi; Nate, Kazuo; Nakatani, Mitsuo; Yokono, Hitoshi; and Endo, Takeshi, 4,530,746, Cl. 204-159.130.
Yokoya, Yuji: *See*—
Toyoda, Shuhei; Yokoya, Yuji; and Ishii, Hakumi, 4,530,254, Cl. 74-493.000.
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, to Green Cross Corporation, The. Perfluorotricyclic amines as oxygen carriers. 4,530,926, Cl. 514-214.000.
Yokoyama, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha. Pulse-width modulation circuit. 4,531,096, Cl. 330-10.000.
Yoneda, Yosuke, to Tomy Kogyo Company, Incorporated. Summersaulting toy. 4,530,672, Cl. 446-324.000.
Yonker, John H.; Williams, Charles R.; and Granhaug, Otto J. Valve. 4,530,485, Cl. 251-93.000.
York, Norman N. Apparatus for removing tree stumps. 4,530,385, Cl. 144-2.00N.
Yoshida, Tomohiko, to Mitsubishi Rayon Company Ltd. Polyester resin composition having an improved mold release property. 4,530,953, Cl. 524-311.000.
Yoshida, Yoshinobu: *See*—
Ohki, Nobutaka; Furutachi, Nobuo; and Yoshida, Yoshinobu, 4,530,899, Cl. 430-551.000.
Yoshikawa, Yasuhiko: *See*—
Kimura, Hiroshi; Hisajima, Masahiko; Shibata, Kiyoshi; Irie, Yoichiro; Morimoto, Kiyoshi; Nagashima, Takashi; Yoshikawa, Yasuhiko; Watashi, Masahiro; Yamamoto, Kiyonori; Yamamoto, Toshihiko; and Yoshinaga, Shinsuke, 4,530,588, Cl. 355-3.0DR.
Yoshimatsu, Sachihiro: *See*—
Nakazato, Norio; Yoshimatsu, Sachihiro; Nawata, Makoto; and Masuda, Sadao, 4,530,708, Cl. 62-13.000.
Yoshinada, Hiroshi; Oshima, Hiroshi; and Ono, Takashi, to Kabushiki Kaisha Komatsu Seisakusho. Control system for positioning implements. 4,531,082, Cl. 318-663.000.
Yoshinaga, Shinsuke: *See*—
Kimura, Hiroshi; Hisajima, Masahiko; Shibata, Kiyoshi; Irie, Yoichiro; Morimoto, Kiyoshi; Nagashima, Takashi; Yoshikawa,

Yasuhiko; Watashi, Masahiro; Yamamoto, Kiyonori; Yamamoto, Toshihiko; and Yoshinaga, Shinsuke, 4,530,588, Cl. 355-3.0DR.

Yoshino Kogyosho Co. Ltd.: *See*—
Nozawa, Takamitsu; Kishi, Takao; and Iizuka, Shigeo, 4,530,449, Cl. 222-189.000.

Yoshino, Takeshi: *See*—
Hara, Hiroshi; Tobioka, Takashi; Yoshino, Takeshi; Nishikawa, Tetuo; and Sekine, Jiro, 4,530,582, Cl. 354-203.000.

You, Chin-San. Ski construction. 4,530,871, Cl. 428-111.000.

Young, James: *See*—
Hanak, Joseph J.; Nath, Prem; Izu, Masatsugu; and Young, James, 4,530,739, Cl. 204-4.000.

Youngkeit, Dean, to Thiokol Corporation. Method of coating fiber materials with resin. 4,530,855, Cl. 427-175.000.

Yuasa Battery Co., Ltd.: *See*—
Kagawa, Hiroshi; and Iwabuchi, Suminobu, 4,530,151, Cl. 29-623.100.

Zabala, Bert M. Sandal. 4,530,171, Cl. 36-11.500.

Zaidan Hojin Biseibutsu Kagaku KenkyuKai: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Ishizuka, Masaaki; Takita, Tomohisa; Shimada, Nobuyoshi; and Kato, Kuniki, 4,530,998, Cl. 536-24.000.

Zampini, Anthony: *See*—
Malon, Raymond F.; and Zampini, Anthony, 4,530,703, Cl. 55-16.000.

Zaremba, Dieter, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Drive arrangement of an auxiliary device in an internal combustion engine. 4,530,313, Cl. 123-41.470.

Zech, Hendrik: *See*—
Forssmann, Bernd; Wess, Othmar; Zech, Hendrik; and Chaussy, Christian, 4,530,358, Cl. 128-328.000.

Zegers, Leo E.: *See*—
Chung, Kah-Seng; and Zegers, Leo E., 4,531,221, Cl. 375-60.000.

Zekich, Michael B.: *See*—
Heise, Stanley R.; Blackston, Michael D.; Zekich, Michael B.; and Parselle, John L. B., 4,530,183, Cl. 49-42.000.

Zell, Warren E.; Imel, Charles E.; Saam, Richard D.; Hearst, Peter J.; Olah, Nicholas J.; Bialecki, Adolph; and Biggers, Rececca L., to United States of America, Navy. Automatic vacuum recyclable system for chemical-thermo cleaning of ship tanks and bilges. 4,530,131, Cl. 15-321.000.

Zeller Corporation, The: *See*—
Mazziotti, Philip J., 4,530,675, Cl. 464-131.000.

Zenker, Reinhard: *See*—
Mann, Arnold; Ruschek, Gerhard; and Zenker, Reinhard, 4,530,326, Cl. 123-342.000.

Ziegler, Guenther: *See*—
Weyrich, Claus; Ziegler, Guenther; Hoffmann, Ludwig; and Theis, Dietmar, 4,531,142, Cl. 357-17.000.

Zimmermann, Hans; Pieper, Fritz; and Nagel, Hartmut, to Veb Kombinat Polygraph "Werner Lamberz" Leipzig. Pick-up unit in a sheet-transporting device of a printing machine. 4,530,495, Cl. 271-204.000.

Zollner, Dieter; Lauterbach-Dammler, Inge; Taube, Thomas; Lades, Hans; Liebel, Siegfried; and Bauer, Hanns-Georg, to ARC Technologies Systems Ltd. Electrode assembly for arc furnaces. 4,531,219, Cl. 373-101.000.

Zuwala, Stanley M.; and Cass, Lloyd D., to New Horizons Manufacturing Ltd. Cell configuration for apparatus for electrolytic recovery of silver from spent photographic processing solutions. 4,530,748, Cl. 204-273.000.

Zverina, Karel; Tluchor, Denek; Szabo, Josef; Polidor, Jaromir; and Kroupa, Petr, to Ceskoslovenska akademie ved. Method of and apparatus for stabilization of low-temperature plasma of an arc burner. 4,531,043, Cl. 219-121.0PP.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF JULY, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Allan, Thomas T.: *See—*
Wilcox, David E.; and Allan, Thomas T., Re. 31,952, Cl. 73-40.700.

Austin Powder Company: *See—*
Calder, Brooke J., Jr.; Childs, David L.; Prescott, Roger N.; and Lyons, Donald W., Re. 31,953, Cl. 86-20.00C.

Calder, Brooke J., Jr.; Childs, David L.; Prescott, Roger N.; and Lyons, Donald W., to Austin Powder Company. Method of charging a borehole. Re. 31,953, Cl. 86-20.00C.

Childs, David L.: *See—*
Calder, Brooke J., Jr.; Childs, David L.; Prescott, Roger N.; and Lyons, Donald W., Re. 31,953, Cl. 86-20.00C.

Colgate-Palmolive Company: *See—*
Fine, Ralph; and Weiss, Sidney, Re. 31,954, Cl. 424-49.000.

Fine, Ralph; and Weiss, Sidney, to Colgate-Palmolive Company. Oral composition. Re. 31,954, Cl. 424-49.000.

Flanders Filters, Inc.: *See—*
Wilcox, David E.; and Allan, Thomas T., Re. 31,952, Cl. 73-40.700.

Lyons, Donald W.: *See—*
Calder, Brooke J., Jr.; Childs, David L.; Prescott, Roger N.; and Lyons, Donald W., Re. 31,953, Cl. 86-20.00C.

Prescott, Roger N.: *See—*
Calder, Brooke J., Jr.; Childs, David L.; Prescott, Roger N.; and Lyons, Donald W., Re. 31,953, Cl. 86-20.00C.

Weiss, Sidney: *See—*
Fine, Ralph; and Weiss, Sidney, Re. 31,954, Cl. 424-49.000.

Wilcox, David E.; and Allan, Thomas T., to Flanders Filters, Inc. Method and apparatus for the leak testing of filters. Re. 31,952, Cl. 73-40.700.

LIST OF DESIGN PATENTEES

American Commercial Incorporated: *See—*
Lax, Michael, 279,755, Cl. D7-320.000.
Lax, Michael, 279,756, Cl. D7-320.000.
Lax, Michael, 279,757, Cl. D7-320.000.

American District Telegraph Company: *See—*
Thornton, Hugh P., Jr.; and Powers, Robert B., 279,769, Cl. D10-106.000.

American Greetings Corporation: *See—*
Edmisson, Russell C.; and Munson, Leo J., 279,809, Cl. D21-185.000.

Anacker, Charles D., to Anacker, Charles D. Cradle frame. 279,734, 7-23-85, Cl. D6-388.000.

Anacker, Charles D., to Anacker, Charles D. Bunk bed frame. 279,735, 7-23-85, Cl. D6-388.000.

Anacker, Charles D., to Anacker, Charles D. Toy cart frame. 279,807, 7-23-85, Cl. D21-141.000.

Asano, Tamoru, to Kai Jirushi Hamono Center. Scissors. 279,760, 7-23-85, Cl. D8-57.000.

Aspenwall, John E., to Jahabow Industries. Corner display case. 279,739, 7-23-85, Cl. D6-471.000.

AT&T Technologies, Inc.: *See—*
Cooke, Kenneth R.; and Porcelli, Vito L., 279,777, Cl. D14-60.000.

Avento Designs Inc.: *See—*
DiPersia, James, 279,742, Cl. D6-484.000.

Bartholomew, Richard P. Saddle rack. 279,829, 7-23-85, Cl. D30-45.000.

Bismanovsky, Joseph; Clements, Ronald E.; and Rudin, Melvin, to Lane Telecommunications, Inc. Computer terminal. 279,782, 7-23-85, Cl. D14-106.000.

Blue Box Toy Factory Limited: *See—*
Ng, Cheuk Sun, 279,805, Cl. D21-127.000.

Bomatic, Inc.: *See—*
Hestehave, Borge; and Hestehave, Kjeld, 279,763, Cl. D9-375.000.

Breyer-Lindner, Brigitte. Hanging decoration. 279,772, 7-23-85, Cl. D11-81.000.

Breyer-Lindner, Brigitte. Hanging decoration. 279,773, 7-23-85, Cl. D11-81.000.

Brockenshire, Joseph M. Card table top. 279,801, 7-23-85, Cl. D21-37.000.

Bromley, R. Scott, to Cartier Inc. Dining table. 279,741, 7-23-85, Cl. D6-480.000.

Brunetto, Robert H. Surveyor's template. 279,797, 7-23-85, Cl. D19-37.000.

Brussing, Bernd: *See—*
Zeischegge, Walter; and Brussing, Bernd, 279,750, Cl. D6-582.000.

Buchet, Marcel, to L'Oreal, S.A. Lipstick case. 279,827, 7-23-85, Cl. D28-85.000.

Buchet, Marcel, to L'Oreal, S.A. Slim line lipstick case. 279,828, 7-23-85, Cl. D28-85.000.

Callies, Roger: *See—*
Zastera, Stephen R.; and Callies, Roger, 279,736, Cl. D6-400.000.

Carbajales Santa-Eulalia, Javier B.: *See—*
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 279,774, Cl. D11-158.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Company, Inc. Figurine of an armadillo. 279,774, 7-23-85, Cl. D11-158.000.

Carl Manufacturing Co., Ltd.: *See—*
Mori, Chuzo, 279,798, Cl. D19-72.000.

Cartier Inc.: *See—*
Bromley, R. Scott, 279,741, Cl. D6-480.000.

Cellini, Vito. Barrel for firearms. 279,812, 7-23-85, Cl. D22-7.000.

Cesaroni, William C.; and Rauen, Robert P., to Dart Industries Inc. Container lid. 279,758, 7-23-85, Cl. D7-391.000.

Cesaroni, William C.; and Rauen, Robert P., to Dart Industries Inc. Container lid. 279,759, 7-23-85, Cl. D7-391.000.

Chen, Anthony B.; Harte, Richard A.; and Kaufman, Nancy K., to Daryl Laboratories, Inc. Immunoassay test slide. 279,817, 7-23-85, Cl. D24-29.000.

Childers Corporation: *See—*
Childers, Roger K., 279,792, Cl. D18-3.000.
Childers, Roger K., 279,793, Cl. D18-3.000.
Childers, Roger K., 279,794, Cl. D18-3.000.

Childers, Roger K., to Childers Corporation. Coin-sorting and counting machine. 279,792, 7-23-85, Cl. D18-3.000.

Childers, Roger K., to Childers Corporation. Coin-sorting and counting machine. 279,793, 7-23-85, Cl. D18-3.000.

Childers, Roger K., to Childers Corporation. Coin-sorting and counting machine. 279,794, 7-23-85, Cl. D18-3.000.

Clements, Ronald E.: *See—*
Bismanovsky, Joseph; Clements, Ronald E.; and Rudin, Melvin, 279,782, Cl. D14-106.000.

Combi Co., Ltd.: *See—*
Nakao, Shinroku; Ishii, Yoshiyasu; and Ishii, Kenshun, 279,811, Cl. D21-194.000.

Cooke, Kenneth R.; and Porcelli, Vito L., to AT&T Technologies, Inc. Telephone instrument base for a handset. 279,777, 7-23-85, Cl. D14-60.000.

D.R.I. Industries, Inc.: *See—*
Zastera, Stephen R.; and Callies, Roger, 279,736, Cl. D6-400.000.

Dart Industries Inc.: *See—*
Cesaroni, William C.; and Rauen, Robert P., 279,758, Cl. D7-391.000.
Cesaroni, William C.; and Rauen, Robert P., 279,759, Cl. D7-391.000.

Daryl Laboratories, Inc.: *See—*
Chen, Anthony B.; Harte, Richard A.; and Kaufman, Nancy K., 279,817, Cl. D24-29.000.

Dawe, George. Cabinet for a computer terminal. 279,738, 7-23-85, Cl. D6-433.000.

Diamond Machine Company: *See—*
Lavenger, Frank; and Kelley, Dean, 279,737, Cl. D6-423.000.

DiPersia, James, to Avento Designs Inc. Console. 279,742, 7-23-85, Cl. D6-484.000.

Dixon-Manning Sales and Marketing Limited: *See—*
Manning, Peter R., 279,803, Cl. D21-86.000.

Douglas, Randall C. Heating pad. 279,818, 7-23-85, Cl. D24-36.000.

Eastern Company, The: *See—*
Weinerman, Lee S.; and Putzier, Fredrick L., 279,761, Cl. D8-306.000.

Edmisson, Russell C.; and Munson, Leo J., to American Greetings Corporation. Segmented toy figure. 279,809, 7-23-85, Cl. D21-185.000.

Eldon Industries, Inc.: *See—*
Gaines, Jack, 279,814, Cl. D23-77.000.

Endo, Hiroshi: *See—*
Nishiwaki, Katsuhiko; Takeuchi, Akitaka; Endo, Hiroshi; Kawakami, Akihiro; and Matsumura, Hideo, 279,780, Cl. D14-94.000.

Epson Corporation: *See—*
Kawakami, Yoshikazu, 279,781, Cl. D14-100.000.
Kurihara, Masaki, 279,728, Cl. D3-73.000.

Essilor International, Cie Generale d'Optique: *See—*
Leray, Claire, 279,795, Cl. D18-24.000.

Ferdinand, Irwin J.; Handler, Milton C.; Sylvan, Richard; and Peterson, Michael. Stool. 279,731, 7-23-85, Cl. D6-352.000.

Fontana, Fernando, to Omega S.A. Watch case. 279,765, 7-23-85, Cl. D10-32.000.

Fox, Herman. Stringed musical instrument. 279,789, 7-23-85, Cl. D17-18.000.

Gaines, Jack, to Eldon Industries, Inc. Hot air gun. 279,814, 7-23-85, Cl. D23-77.000.

Gard, Eric A., to Pennsylvania Scale Company. Portable scale. 279,768, 7-23-85, Cl. D10-91.000.

Glenn, Willie J. Display board. 279,800, 7-23-85, Cl. D20-42.000.

GTE Business Communication Systems: *See—*
Mitchell, Michael, 279,776, Cl. D14-60.000.

Halm, Hans, to Wilkinson Sword GmbH. Razor handle. 279,824, 7-23-85, Cl. D28-48.000.

Handler, Milton C.: *See—*
Ferdinand, Irwin J.; Handler, Milton C.; Sylvan, Richard; and Peterson, Michael, 279,731, Cl. D6-352.000.

Hansen, Erik L., to Rosti A/S. Garlic squeezer. 279,754, 7-23-85, Cl. D7-101.000.

Harte, Richard A.: *See—*
Chen, Anthony B.; Harte, Richard A.; and Kaufman, Nancy K., 279,817, Cl. D24-29.000.

Heliton, Roy D. Photographic display apparatus. 279,796, 7-23-85, Cl. D19-26.000.

Hestehave, Borge; and Hestehave, Kjeld, to Bomatic, Inc. Container for paint or the like. 279,763, 7-23-85, Cl. D9-375.000.

Hestehave, Kjeld: *See—*
Hestehave, Borge; and Hestehave, Kjeld, 279,763, Cl. D9-375.000.

Hinata, Kozaburo, to Kobishi Electric Co., Ltd. Siren. 279,771, 7-23-85, Cl. D10-120.000.

Hitachi, Ltd.: *See—*
Nishiwaki, Katsuhiko; Takeuchi, Akitaka; Endo, Hiroshi; Kawakami, Akihiro; and Matsumura, Hideo, 279,780, Cl. D14-94.000.

Honda, Keisuke. Ultrasonic sonar. 279,766, 7-23-85, Cl. D10-46.000.

International Playtex, Inc.: *See—*
Nienstedt, Donald; and Tedeschi, Anthony, 279,726, Cl. D2-24.000.
Tedeschi, Anthony, 279,725, Cl. D2-24.000.

Io, Fumitaka, to Minolta Camera Kabushiki Kaisha. Photographic camera. 279,788, 7-23-85, Cl. D16-6.000.

Ishii, Kenshun: *See—*
Nakao, Shinroku; Ishii, Yoshiyasu; and Ishii, Kenshun, 279,811, Cl. D21-194.000.

Ishii, Yoshiyasu: *See—*
Nakao, Shinroku; Ishii, Yoshiyasu; and Ishii, Kenshun, 279,811, Cl. D21-194.000.

Izumi Seimitsu Kogyo Kabushiki: *See—*
Takizawa, Toshio, 279,825, Cl. D28-50.000.

Jagger, Vivienne D., to Little People Limited. Drinking vessel. 279,752, 7-23-85, Cl. D7-10.000.

Jahabow Industries: *See—*
Aspenwall, John E., 279,739, Cl. D6-471.000.

Jamieson, John E.: *See—*
Jordan, James B.; and Jamieson, John E., 279,783, Cl. D14-111.000.

John J. Madison Company, Inc.: *See—*
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 279,774, Cl. D11-158.000.

John Manufacturing Limited: *See—*
Yuen, John S., 279,815, Cl. D23-146.000.
Yuen, John S., 279,819, Cl. D26-42.000.
Yuen, John S., 279,820, Cl. D26-42.000.

Jordan, James B.; and Jamieson, John E., to Qume Corporation. Integrated printer and feeder housing. 279,783, 7-23-85, Cl. D14-111.000.

Kabushiki Kaisha Audio-Technica: *See—*
Nemoto, Mitsuo, 279,775, Cl. D14-14.000.

Kabushiki Kaisha Suwa Seikosha: *See—*
Kawakami, Yoshikazu, 279,781, Cl. D14-100.000.
Kurihara, Masaki, 279,728, Cl. D3-73.000.

Kai Jirushi Hamono Center: *See—*
Asano, Tamoru, 279,760, Cl. D8-57.000.

Kajita, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Bank note takeout machine. 279,790, 7-23-85, Cl. D18-3.000.

Kaufman, Nancy K.: *See—*
Chen, Anthony B.; Harte, Richard A.; and Kaufman, Nancy K., 279,817, Cl. D24-29.000.

Kawakami, Akihiro: *See—*
Nishiwaki, Katsuhiko; Takeuchi, Akitaka; Endo, Hiroshi; Kawakami, Akihiro; and Matsumura, Hideo, 279,780, Cl. D14-94.000.

Kawakami, Yoshikazu, to Epson Corporation; and Kabushiki Kaisha Suwa Seikosha. Portable personal computer. 279,781, 7-23-85, Cl. D14-100.000.

Kelley, Dean: *See—*
Lavenger, Frank; and Kelley, Dean, 279,737, Cl. D6-423.000.

Kellogg, Arthur S. Display rack. 279,743, 7-23-85, Cl. D6-517.000.

Kellogg, Arthur S. Display rack. 279,744, 7-23-85, Cl. D6-517.000.

Kellogg, Arthur S. Display rack. 279,745, 7-23-85, Cl. D6-517.000.

Kellogg, Arthur S. Display rack. 279,746, 7-23-85, Cl. D6-517.000.

Kellogg, Arthur S. Display rack. 279,747, 7-23-85, Cl. D6-517.000.

Kellogg, Arthur S. Display rack. 279,748, 7-23-85, Cl. D6-517.000.

Kobishi Electric Co., Ltd.: *See—*
Hinata, Kozaburo, 279,771, Cl. D10-120.000.

Kupperman, Dennis: *See—*
Kupperman, Sam; and Kupperman, Dennis, 279,799, Cl. D20-13.000.

Kupperman, Sam; and Kupperman, Dennis, to RB Toy Development Co. Bicycle license plate. 279,799, 7-23-85, Cl. D20-13.000.

Kurihara, Masaki, to Epson Corporation; and Kabushiki Kaisha Suwa Seikosha. Carrying case. 279,728, 7-23-85, Cl. D3-73.000.

Kverneland A/S: *See—*
Nja, Olav, 279,786, Cl. D15-29.000.

Lane Telecommunications, Inc.: *See—*
Bismanovsky, Joseph; Clements, Ronald E.; and Rudin, Melvin, 279,782, Cl. D14-106.000.

Lavenger, Frank; and Kelley, Dean, to Diamond Machine Company. Work station module. 279,737, 7-23-85, Cl. D6-423.000.

Lax, Michael, to American Commercial Incorporated. Kettle. 279,755, 7-23-85, Cl. D7-320.000.

Lax, Michael, to American Commercial Incorporated. Kettle. 279,756, 7-23-85, Cl. D7-320.000.

Lax, Michael, to American Commercial Incorporated. Kettle. 279,757, 7-23-85, Cl. D7-320.000.

Leray, Claire, to Essilor International, Cie Generale d'Optique. Font of type. 279,795, 7-23-85, Cl. D18-24.000.

Lerch, Karl D.: *See—*
Stern, Carl M.; and Lerch, Karl D., 279,806, Cl. D21-128.000.

Lester, Bud W.: *See—*
Parker, John C.; Terry, Norman L.; and Lester, Bud W., 279,823, Cl. D26-140.000.

Little People Limited: *See—*
Jagger, Vivienne D., 279,752, Cl. D7-10.000.

L'Oreal, S.A.: *See—*
Buchet, Marcel, 279,827, Cl. D28-85.000.
Buchet, Marcel, 279,828, Cl. D28-85.000.

Ma, Lai K., to Sonca Industries Limited. Combined lantern and torch. 279,821, 7-23-85, Cl. D26-42.000.

Manning, Peter R., to Dixon-Manning Sales and Marketing Limited. Aerial toy. 279,803, 7-23-85, Cl. D21-86.000.

Matsumura, Hideo: *See—*
Nishiwaki, Katsuhiko; Takeuchi, Akitaka; Endo, Hiroshi; Kawakami, Akihiro; and Matsumura, Hideo, 279,780, Cl. D14-94.000.

Minolta Camera Kabushiki Kaisha: *See—*
Io, Fumitaka, 279,788, Cl. D16-6.000.

Mitchell, John W., Sr. Dental articulator. 279,816, 7-23-85, Cl. D24-10.000.

Mitchell, Maureen R. Novelty wrap. 279,727, 7-23-85, Cl. D2-343.000.

Mitchell, Michael, to GTE Business Communication Systems. Modular telephone base unit. 279,776, 7-23-85, Cl. D14-60.000.

Mohly Shop Co., Ltd.: *See—*
Nakamura, Noboru, 279,733, Cl. D6-373.000.

Mori, Chuzo, to Carl Manufacturing Co., Ltd. Tool for settling paper to be punched with numerous perforations. 279,798, 7-23-85, Cl. D19-72.000.

Motorola, Inc.: *See—*
Taylor, Terrance N., 279,779, Cl. D14-68.000.

Munson, Leo J.: *See—*
Edmisson, Russell C.; and Munson, Leo J., 279,809, Cl. D21-185.000.

Nakamura, Noboru, to Mohly Shop Co., Ltd. Chair. 279,733, 7-23-85, Cl. D6-373.000.

Nakao, Shinroku; Ishii, Yoshiyasu; and Ishii, Kenshun, to Combi Co., Ltd. Ergometer. 279,811, 7-23-85, Cl. D21-194.000.

Nemoto, Mitsuo, to Kabushiki Kaisha Audio-Technica. Record disc player system or similar article. 279,775, 7-23-85, Cl. D14-14.000.

Ng, Cheuk Sun, to Blue Box Toy Factory Limited. Toy typewriter. 279,805, 7-23-85, Cl. D21-127.000.

Nienstedt, Donald; and Tedeschi, Anthony, to International Playtex, Inc. Brassiere. 279,726, 7-23-85, Cl. D2-24.000.

Nishida, Yoshiaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Cash classifying and totalizing machine. 279,791, 7-23-85, Cl. D18-3.000.

Nishiwaki, Katsuhiko; Takeuchi, Akitaka; Endo, Hiroshi; Kawakami, Akihiro; and Matsumura, Hideo, to Hitachi, Ltd. Facsimile transceiver. 279,780, 7-23-85, Cl. D14-94.000.

Nja, Olav, to Kverneland A/S. Tooth for buckets on digging and loading machines. 279,786, 7-23-85, Cl. D15-29.000.

Noble, James Robert. Exercise board. 279,810, 7-23-85, Cl. D21-191.000.

Nottingham, John. Toy airplane. 279,802, 7-23-85, Cl. D21-83.000.

Ohno, Kouzin, to Takara Co., Ltd. Reconfigurable toy plane. 279,804, 7-23-85, Cl. D21-87.000.

Omega S.A.: *See—*
Fontana, Fernando, 279,765, Cl. D10-32.000.

Palizzolo, Leo C. Arrowhead. 279,813, 7-23-85, Cl. D22-12.000.

Parker, John C.; Terry, Norman L.; and Lester, Bud W., to Teknovation, Inc. Swivel mount for portable lamp. 279,823, 7-23-85, Cl. D26-140.000.

Parker, Norman A. Warning light. 279,770, 7-23-85, Cl. D10-114.000.

Patterson, Jane A.: *See—*
Potts, Stella; and Patterson, Jane A., 279,751, Cl. D6-601.000.

Pennsylvania Scale Company: *See—*
Gard, Eric A., 279,768, Cl. D10-91.000.

Peterson, Michael: *See*—
Ferdinand, Irwin J.; Handler, Milton C.; Sylvan, Richard; and Peterson, Michael, 279,731, Cl. D6-352.000.
Pharo, Daniel A. Figure toy. 279,808, 7-23-85, Cl. D21-155.000.
Plessey Overseas Limited: *See*—
Stoddard, John, 279,778, Cl. D14-62.000.
Polanish, Eugene. Brush applicator. 279,729, 7-23-85, Cl. D4-135.000.
Porcelli, Vito L.: *See*—
Cooke, Kenneth R.; and Porcelli, Vito L., 279,777, Cl. D14-60.000.
Potts, Stella; and Patterson, Jane A. Pillow. 279,751, 7-23-85, Cl. D6-601.000.
Powers, Robert B.: *See*—
Thornton, Hugh P., Jr.; and Powers, Robert B., 279,769, Cl. D10-106.000.
Putzier, Fredrick L.: *See*—
Weinerman, Lee S.; and Putzier, Fredrick L., 279,761, Cl. D8-306.000.
Quaker Oats Company, The: *See*—
Stern, Carl M.; and Lerch, Karl D., 279,806, Cl. D21-128.000.
Qume Corporation: *See*—
Jordan, James B.; and Jamieson, John E., 279,783, Cl. D14-111.000.
Rauen, Robert P.: *See*—
Cesaroni, William C.; and Rauen, Robert P., 279,758, Cl. D7-391.000.
Cesaroni, William C.; and Rauen, Robert P., 279,759, Cl. D7-391.000.
Razmjoo, Sharzad. Distance measuring ski attachment. 279,767, 7-23-85, Cl. D10-70.000.
RB Toy Development Co.: *See*—
Kupperman, Sam; and Kupperman, Dennis, 279,799, Cl. D20-13.000.
Rhoades, Gordon P. Clock. 279,764, 7-23-85, Cl. D10-23.000.
Ricke, Roy R., to Schwann's Sales Enterprises, Inc. Dough embosser. 279,753, 7-23-85, Cl. D7-74.000.
Ritchey, William D. Tie rack or the like. 279,730, 7-23-85, Cl. D6-327.000.
Rosti A/S: *See*—
Hansen, Erik L., 279,754, Cl. D7-101.000.
Roudebush, H. Richard, to Triune Systems, Inc. Pump housing for a roller painting machine. 279,784, 7-23-85, Cl. D15-7.000.
Rudin, Melvin: *See*—
Bismanovsky, Joseph; Clements, Ronald E.; and Rudin, Melvin, 279,782, Cl. D14-106.000.
Schindler, Paul. Combined toothpick and floss holder. 279,826, 7-23-85, Cl. D28-64.000.
Schwann's Sales Enterprises, Inc.: *See*—
Ricke, Roy R., 279,753, Cl. D7-74.000.
Slager, Thomas E. Computer desk. 279,740, 7-23-85, Cl. D6-478.000.
Socias, Henri. Waterproof box for a camera. 279,787, 7-23-85, Cl. D16-2.000.
Sonca Industries Limited: *See*—
Ma, Lai K., 279,821, Cl. D26-42.000.
Stern, Carl M.; and Lerch, Karl D., to Quaker Oats Company, The. Toy space vehicle. 279,806, 7-23-85, Cl. D21-128.000.
Stoddard, John, to Plessey Overseas Limited. Base with dialing means, for a transceiver handset. 279,778, 7-23-85, Cl. D14-62.000.
Sylvan, Richard: *See*—
Ferdinand, Irwin J.; Handler, Milton C.; Sylvan, Richard; and Peterson, Michael, 279,731, Cl. D6-352.000.
Takara Co., Ltd.: *See*—
Ohno, Kouzin, 279,804, Cl. D21-87.000.
Takeuchi, Akitaka: *See*—
Nishiwaki, Katsuhiko; Takeuchi, Akitaka; Endo, Hiroshi; Kawakami, Akihiro; and Matsumura, Hideo, 279,780, Cl. D14-94.000.
Takizawa, Toshio, to Izumi Seimitsu Kogyo Kabushiki. Electric shaver. 279,825, 7-23-85, Cl. D28-50.000.
Taylor, Terrance N., to Motorola, Inc. Control unit for a two-way radio or similar article. 279,779, 7-23-85, Cl. D14-68.000.
TDK Corporation: *See*—
Yoshizawa, Keiichi, 279,762, Cl. D9-305.000.
Tedeschi, Anthony, to International Playtex, Inc. Brassiere. 279,725, 7-23-85, Cl. D2-24.000.
Tedeschi, Anthony: *See*—
Nienstedt, Donald; and Tedeschi, Anthony, 279,726, Cl. D2-24.000.
Teknovation, Inc.: *See*—
Parker, John C.; Terry, Norman L.; and Lester, Bud W., 279,823, Cl. D26-140.000.
Terry, Norman L.: *See*—
Parker, John C.; Terry, Norman L.; and Lester, Bud W., 279,823, Cl. D26-140.000.
Thornton, Hugh P., Jr.; and Powers, Robert B., to American District Telegraph Company. Smoke detector. 279,769, 7-23-85, Cl. D10-106.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Kajita, Takashi, 279,790, Cl. D18-3.000.
Nishida, Yoshiaki, 279,791, Cl. D18-3.000.
Triune Systems, Inc.: *See*—
Roudebush, H. Richard, 279,784, Cl. D15-7.000.
Vaughan, Michael C. Support for a power mask for drilling wells. 279,785, 7-23-85, Cl. D15-21.000.
Vona, Romanino. Display bin. 279,749, 7-23-85, Cl. D6-573.000.
Weinerman, Lee S.; and Putzier, Fredrick L., to Eastern Company, The. Lift and turn latch handle. 279,761, 7-23-85, Cl. D8-306.000.
Wheeler, Phillip L. Luminaire shield. 279,822, 7-23-85, Cl. D26-118.000.
Wilkinson Sword GmbH: *See*—
Halm, Hans, 279,824, Cl. D28-48.000.
Yoshizawa, Keiichi, to TDK Corporation. Wrapping sheet for magnetic tape cassette. 279,762, 7-23-85, Cl. D9-305.000.
Yuen, John S., to John Manufacturing Limited. Portable battery powered humidifier or the like. 279,815, 7-23-85, Cl. D23-146.000.
Yuen, John S., to John Manufacturing Limited. Combined fluorescent lamp and flashlight incorporating an emergency beacon. 279,819, 7-23-85, Cl. D26-42.000.
Yuen, John S., to John Manufacturing Limited. Combined torch and lantern. 279,820, 7-23-85, Cl. D26-42.000.
Zastera, Stephen R.; and Callies, Roger, to D.R.I. Industries, Inc. Collapsible workbench or similar article. 279,736, 7-23-85, Cl. D6-400.000.
Zeischegge, Walter; and Brussing, Bernd. Antislip flexible mat. 279,750, 7-23-85, Cl. D6-582.000.
Zlotnick, Jan. Swivel lounge chair. 279,732, 7-23-85, Cl. D6-361.000.

LIST OF PLANT PATENTEES

Armstrong Nurseries, Inc.: *See*—
McGredy, Samuel, IV, 5,519, Cl. 20.000.
Bennett, Cecelia L. D. Miniature rose plant. 5,518, 7-23-85, Cl. 7.000.
Bracken, Ray, to Ray Bracken Nursery, Inc. Magnolia grandiflora named Brackens Brown Beauty. 5,520, 7-23-85, Cl. 51.000.
Culbert, John R., to University of Illinois. Chrysanthemum plant named Illini Harvest. 5,521, 7-23-85, Cl. 74.000.
McGredy, Samuel, IV, to Armstrong Nurseries, Inc. Hybrid tea rose plant vc. Macauck. 5,519, 7-23-85, Cl. 20.000.
Ray Bracken Nursery, Inc.: *See*—
Bracken, Ray, 5,520, Cl. 51.000.
University of Illinois: *See*—
Culbert, John R., 5,521, Cl. 74.000.

CLASSIFICATION OF PATENTS

ISSUED JULY 23, 1985

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2.5 4,530,111
209.2 4,530,112

CLASS 4

228 4,530,118
324 4,530,119
538 4,530,120
540 4,530,121

CLASS 5

83 4,530,122
110 4,530,123

CLASS 12

12.4 4,530,124

CLASS 15

1.7 4,530,125
97 B 4,530,126
104.04 4,530,127
182 4,530,128
184 4,530,129
229 A 4,530,130
321 4,530,131

CLASS 17

45 4,530,132

CLASS 19

97 4,530,133
105 4,530,134

CLASS 23

301 4,530,699

CLASS 24

68 CD 4,530,135
608 4,530,136

CLASS 28

171 4,530,137

CLASS 29

25.35 4,530,138
4,530,139
110 4,530,140
156.4 WL 4,530,141
237 4,530,142
407 4,530,143
4,530,144
458 4,530,145
468 4,530,146
525 4,530,147
568 4,530,148
571 4,530,149
576 B 4,530,150
588 4,530,152
623.1 4,530,151
4,530,153

CLASS 30

294 4,530,154

CLASS 33

1 L 4,530,155
27 R 4,530,156
125 R 4,530,157
169 B 4,530,158
169 R 4,530,159
178 E 4,530,161
228 4,530,162
265 4,530,163
324 4,530,164
559 4,530,160

CLASS 34

32 4,530,165
39 4,530,166
47 4,530,167
57 E 4,530,169
82 4,530,170
106 4,530,168

CLASS 36

11.5 4,530,171
92 4,530,173

CLASS 37

8 4,530,174

CLASS 40

10 B 4,530,175
359 4,530,176
621 4,530,177

CLASS 43

26 4,530,178
42.06 4,530,179
42.28 4,530,180
44.88 4,530,181
102 4,530,182

CLASS 44

1 E 4,530,700
51 4,530,701

CLASS 48

209 4,530,702

CLASS 49

42 4,530,183
213 4,530,184
280 4,530,185
441 4,530,186

CLASS 51

165.87 4,530,187
214 4,530,188

CLASS 52

30 4,530,189
165 4,530,190
309.7 4,530,191
397 4,530,192
408 4,530,193
712 4,530,194
726 4,530,195
747 4,530,196
797 4,530,197

CLASS 53

48 4,530,198
53 4,530,199
157 4,530,200
397 4,530,201
426 4,530,202

CLASS 55

16 4,530,703
48 4,530,704
162 4,530,705
275 4,530,706
440 4,530,707

CLASS 56

27.5 4,530,203
298 4,530,204

CLASS 57

9 4,530,205
250 4,530,206

CLASS 60

39.464 4,530,207
516 4,530,208
547.1 4,530,209
605 4,530,210
641.5 4,530,211
657 4,530,212

CLASS 62

13 4,530,708
55.5 4,530,213
71 4,530,214
84 4,530,215
89 4,530,216
156 4,530,217
4,530,218
503 4,530,219
530 4,530,220

CLASS 63

2 4,530,221

CLASS 65

3.12 4,530,709
56 4,530,710
260 4,530,711
270 4,530,712

CLASS 70

364 R 4,530,222
417 4,530,223

CLASS 71

28 4,530,713
4,530,714
76 4,530,715
88 4,530,716
90 4,530,717

CLASS 72

15 4,530,224
52 4,530,225
171 4,530,226
241 4,530,227
349 4,530,228
354 4,530,229
363 4,530,230
393 4,530,231
447 4,530,232

CLASS 73

23 4,530,233
40.7 Re.31,952
53 4,530,234
81 4,530,235
84 4,530,236
178 R 4,530,237
431 4,530,238
455 4,530,239
593 4,530,240
602 4,530,241
625 4,530,242
633 4,530,243
727 4,530,244
768 4,530,245
799 4,530,246
861 4,530,247
862.17 4,530,248
862.54 4,530,249
863.12 4,530,250

CLASS 74

89.15 4,530,251
388 R 4,530,252
440 4,530,253
493 4,530,254
604 4,530,255
689 4,530,256
796 4,530,257

CLASS 75

121 4,530,718
124 4,530,719
128 A 4,530,720

CLASS 76

25 A 4,530,258
101 D 4,530,259

CLASS 81

3.55 4,530,260
177 UJ 4,530,261
177.9 4,530,262

CLASS 82

36 R 4,530,263

CLASS 83

175 4,530,264
337 4,530,265
801 4,530,266

CLASS 84

1.03 4,530,267
1.16 4,530,268

CLASS 86

20 C Re.31,953

CLASS 89

1.11 4,530,270
1.14 4,530,269

CLASS 91

509 4,530,271

CLASS 98

33 A 4,530,272
42.01 4,530,273
115.2 4,530,274

CLASS 99

353 4,530,275
386 4,530,276
506 4,530,277
547 4,530,278

CLASS 100

5 4,530,279

CLASS 101

93.02 4,530,280
104 4,530,281
177 4,530,282
230 4,530,283
350 4,530,284
365 4,530,285
395 4,530,286

CLASS 104

168 4,530,287

CLASS 105

358 4,530,288

CLASS 106

2 4,530,721
38.35 4,530,722
90 4,530,723
288 Q 4,530,724
298 4,530,725

CLASS 110

117 4,530,289
245 4,530,290
342 4,530,291
346 4,530,292

CLASS 111

2 4,530,293

CLASS 112

63 4,530,294
121.12 4,530,295
229 4,530,296
275 4,530,297
315 4,530,298

CLASS 114

39 4,530,299
43 4,530,300
102 4,530,301
230 4,530,302
332 4,530,303

CLASS 118

66 4,530,304
418 4,530,305
669 4,530,306

CLASS 119

14.49 4,530,307
52 B 4,530,308
96 4,530,309
109 4,530,310

CLASS 122

7 R 4,530,311

CLASS 123

41.35 4,530,312
41.47 4,530,313
41.74 4,530,314
4,530,315
41.77 4,530,323
44 R 4,530,316
46 R 4,530,317
90.17 4,530,318
90.46 4,530,319
90.56 4,530,320
179 H 4,530,321
188 AA 4,530,322
300 4,530,324
308 4,530,325
342 4,530,326
357 4,530,327
425 4,530,328
447 4,530,329
449 4,530,330
450 4,530,331
481 4,530,332
489 4,530,333
494 4,530,334
495 4,530,335
502 4,530,336
506 4,530,337
559 4,530,338
561 4,530,339
669 4,530,340
4,530,341

CLASS 124

24 R 4,530,342

CLASS 126

9 A 4,530,343
40 4,530,345
77 4,530,346
246 4,530,344
360 R 4,530,347
444 4,530,348

CLASS 128

1 R 4,530,349
82 4,530,350
4,530,351
89 R 4,530,352
92 BB 4,530,355
156 4,530,353
207.17 4,530,354
305 4,530,356
312 4,530,357
328 4,530,358
329 R 4,530,359
419 F 4,530,360
483 4,530,361
660 4,530,362
663 4,530,363
670 4,530,364
696 4,530,365
736 4,530,366
777 4,530,367
784 4,530,368

CLASS 132

84 B 4,530,369

CLASS 134

6 4,530,726
57 R 4,530,370

CLASS 136

258 4,531,015

CLASS 137

115 4,530,371
392 4,530,372
516.29 4,530,373
625.3 4,530,374
625.32 4,530,375
636.1 4,530,376
637.2 4,530,377

CLASS 138

109 4,530,378
4,530,379

CLASS 139

59 4,530,380
452 4,530,381
455 4,530,382

CLASS 141

71 4,530,383
95 4,530,384

CLASS 144

2 N 4,530,385

CLASS 148

2 4,530,727

CLASS 149

19.6 4,530,728

CLASS 152

315 4,530,386
410 4,530,387

CLASS 156

217 4,530,729
227 4,530,730
4,530,731
244.18 4,530,732
441 4,530,733
628 4,530,734
642 4,530,735
643 4,530,736

CLASS 157

1.22 4,530,388

CLASS 159

47.1 4,530,737

CLASS 160

46 4,530,389
178 R 4,530,390

CLASS 164

155 4,530,391
268 4,530,392
415 4,530,393
467 4,530,394
4,530,404

CLASS 165

16 4,530,395

CLASS 166

63 4,530,396
84 4,530,397
123 4,530,398
173 4,530,399
273 4,530,400
291 4,530,402
303 4,530,401

CLASS 171

16 4,530,403

CLASS 172

126 4,530,405
705 4,530,406

CLASS 173

17 4,530,407
4,530,408
131 4,530,409

CLASS 174

87 4,531,016
138 J 4,531,017
140 R 4,531,018
163 F 4,531,019

CLASS 175

57 4,530,410

CLASS 178

22.08 4,531,020
4,531,021
22.19 4,531,022

CLASS 179

2 R 4,531,023
2 TS 4,531,024
115.5 VC 4,531,025

CLASS 180

11 4,530,411
69.21 4,530,412
79.1 4,530,413
142 4,530,414
297 4,530,415
307 4,530,416

CLASS 181

223 4,530,417
227 4,530,418

CLASS 182

106 4,530,419
221 4,530,420

CLASS 184

1.5 4,530,421

CLASS 188

52 4,530,422
73.39 4,530,423
196 D 4,530,424
299 4,530,425

CLASS 192

4 A 4,530,426
4,530,427

CLASS 193

40 4,530,428

CLASS 198

313 4,530,429
395 4,530,430
534 4,530,431
662 4,530,432
695 4,530,433

CLASS 200

5 R 4,531,026
6 A 4,531,027
38 R 4,531,028
61.62 4,531,029
68.2 4,531,030
82 B 4,531,031
153 J 4,531,032
314 4,531,033

4,531,034

CLASS 203

2 4,530,738

CLASS 204

4 4,530,739
9 4,530,740
54 R 4,530,741
95 4,530,742
98 4,530,743
129 4,530,744
130 4,530,745
159.13 4,530,746
159.16 4,530,747
273 4,530,748
296 4,530,749
298 4,530,750
424 4,530,751

CLASS 208

11 R 4,530,752
68 4,530,753
4,530,754
96 4,530,755
111 4,530,756
251 R 4,530,757

CLASS 209

166 4,530,758
588 4,530,434
592 4,530,435

CLASS 210

104 4,530,759
242.3 4,530,760
407 4,530,761
603 4,530,762
610 4,530,763
637 4,530,764
663 4,530,765
701 4,530,766
708 4,530,767
719 4,530,768
769 4,530,769

CLASS 215

246 4,530,436
252 4,530,437
4,530,438

CLASS 219

8.5 4,531,035
10.43 4,531,036
10.75 4,531,037
10.81 4,531,038
60 R 4,531,039
74 4,531,040
90 4,531,041
99 4,531,042
121 LM 4,531,044
121 PP 4,531,043
132 4,531,045
297 4,531,046
354 4,531,047
525 4,531,048
549 4,531,049

CLASS 220

90.4 4,530,439
201 4,530,440
215 4,530,441
327 4,530,443
354 4,530,442

CLASS 221

37 4,530,444
198 4,530,445
223 4,530,446
288 4,530,447

CLASS 222

181 4,530,448
189 4,530,449
402.1 4,530,450

CLASS 224

155 4,530,451

CLASS 225

96 4,530,452

CLASS 227

19 4,530,453
129 4,530,454
130 4,530,455

CLASS 228

102 4,530,456
180.1 4,530,458
180.2 4,530,457

CLASS 229

23 R 4,530,459
27 4,530,460
37 R 4,530,461

CLASS 235

1 C 4,531,051
1 D 4,531,050
404 4,531,052

CLASS 239

7 4,530,462
71 4,530,463
102 4,530,464
127 4,530,465
327 4,530,466
407 4,530,467
419.3 4,530,468
569 4,530,469

CLASS 241

169.1 4,530,470

CLASS 242

45 4,530,471
55.3 4,530,472
4,530,473
84.52 R 4,530,474
199 4,530,475

CLASS 244

3.21 4,530,476
153 R 4,530,477

CLASS 248

62 4,530,478
309.1 4,530,479
311.2 4,530,480
394 4,530,481
475.1 4,530,482
500 4,530,483

CLASS 249

56 4,530,484

CLASS 250

201 4,531,053
4,531,054
211 J 4,531,055
288 4,531,056
311 4,531,057
363 S 4,531,058
370 4,531,059
548 4,531,060
566 4,531,061
578 4,531,062

CLASS 251

93 4,530,485
129 4,530,486
138 4,530,487
167 4,530,488

CLASS 252

49.6 4,530,770
4,530,771
56 S 4,530,772
67 4,530,773
108 4,530,774
128 4,530,775
153 4,530,776
182 4,530,777
500 4,530,778
507 4,530,779
528 4,530,780
546 4,530,781
578 4,530,782
628 4,530,783

CLASS 260

112 B 4,530,786
112 R 4,530,784
4,530,785
4,530,787
123.5 4,530,788
239 R 4,530,789
239.3 P 4,530,790
245.2 R 4,530,792
4,530,793
245.2 T 4,530,791
245.91 4,530,794
397.4 4,530,795
453 P 4,530,796
465 C 4,530,797
465 E 4,530,798
501.13 4,530,799
501.21 4,530,800
503 4,530,801
925 4,530,802

CLASS 261

29 4,530,803
30 4,530,804
53 4,530,805

CLASS 264

22 4,530,806
51 4,530,807
63 4,530,808
210.7 4,530,809
222 4,530,810
521 4,530,811

CLASS 267

34 4,530,489
47 4,530,490
141 4,530,491

CLASS 269

17 4,530,492
93 4,530,493

CLASS 271

9 4,530,494
204 4,530,495

CLASS 272

68 4,530,496
71 4,530,497
146 4,530,498

CLASS 273

1 GC 4,530,499
32 A 4,530,500
43 R 4,530,501
63 A 4,530,502
144 B 4,530,503
148 B 4,530,504
164 4,530,505

CLASS 277

212 FB 4,530,506

CLASS 279

1 Q 4,530,507
123 4,530,508

CLASS 280

22 4,530,509
47.17 4,530,510
603 4,530,511
661 4,530,512
701 4,530,513
4,530,514
704 4,530,515
741 4,530,516
752 4,530,517
758 4,530,518
770 4,530,519

CLASS 285

21 4,530,520
4,530,521
91 4,530,522
179 4,530,523
187 4,530,524
200 4,530,525
261 4,530,526
382.4 4,530,527

CLASS 290

53 4,531,063

CLASS 292

60 4,530,528
113 4,530,529
256.75 4,530,530
302 4,530,531
341.15 4,530,532

CLASS 294

1.1 4,530,533
82.11 4,530,534
82.24 4,530,535
118 4,530,536

CLASS 296

1 C 4,530,537
24 C 4,530,538

CLASS 297

174 4,530,539
341 4,530,540
452 4,530,541

CLASS 301

37 R 4,530,542
63 PW 4,530,543

CLASS 303

22 R 4,530,544

CLASS 305

16 4,530,545
39 4,530,546

CLASS 307

66 4,531,064
200 A 4,531,065
445 4,531,066
454 4,531,067
473 4,531,068
492 4,531,069

CLASS 308

3.8 4,530,547

CLASS 310

56 4,531,070
156 4,531,071
162 4,531,072
370 4,531,073

CLASS 312

45 4,530,548
121 4,530,549

CLASS 313

331 4,531,074

CLASS 315

3 4,531,075
4 4,531,076
111.81 4,531,077
151 4,531,078
241 P 4,530,550

CLASS 318

254 4,531,079
628 4,531,080
632 4,531,081
663 4,531,082

CLASS 320

9 4,531,083
39 4,531,084

CLASS 323

214 4,531,085
222 4,531,086

CLASS 324

65 P 4,531,087
71.1 4,531,088
99 D 4,531,089
208 4,531,090
242 4,531,091
244 4,531,092
300 4,531,093
309 4,531,094

CLASS 328

165 4,531,095

CLASS 330

10 4,531,096
53 4,531,098
254 4,531,097
267 4,531,099
290 4,531,100
302 4,531,101

CLASS 331

1 A 4,531,102
83 4,531,103
90 4,531,104

CLASS 333

117 4,531,105
173 4,531,106
194 4,531,107

CLASS 336

5 4,531,108
87 4,531,109

CLASS 338

22 R 4,531,110
195 4,531,111

CLASS 339

17 C 4,530,551
17 CF 4,530,552
17 LC 4,530,553
17 M 4,530,554
39 4,530,555
75 M 4,530,557
4,530,558
75 P 4,530,556
90 R 4,530,559
97 R 4,530,560
134 4,530,561
191 R 4,530,562
275 B 4,530,563

CLASS 340

58 4,531,112
347 C 4,531,113
539 4,531,114
4,531,115
568 4,531,116
572 4,531,117
684 4,531,118
712 4,531,119
723 4,531,120
764 4,531,121
781 4,531,122
995 4,531,123

CLASS 343

5 DP 4,531,124
7.9 4,531,125
17.7 4,531,126
4,531,127
18 C 4,531,128
754 4,531,129
767 4,531,130
786 4,531,131

CLASS 346

74.4 4,531,137
76 PH 4,531,132
4,531,133
4,531,134
4,531,135
135.1 4,531,136
4,531,183
140 R 4,531,138
201 4,531,139
209 4,531,140
4,531,141

CLASS 350

3.69 4,530,564
96.10 4,530,565
96.20 4,530,566
4,530,567
96.26 4,530,568
96.34 4,530,569
241 4,530,570
346 4,530,572
358 4,530,573
420 4,530,574
432 4,530,575
452 4,530,576
513 4,530,577
526 4,530,578
629 4,530,571

CLASS 351

212 4,530,579

CLASS 354

82 4,530,580
127.12 4,530,581
203 4,530,582
224 4,530,583
293 4,530,584
416 4,530,585
442 4,530,586

CLASS 355

3 DR 4,530,588
3 R 4,530,589
8 4,530,590
4,530,591
11 4,530,592
14 R 4,530,593
15 4,530,594
4,530,595
4,530,596
4,530,597
53 4,530,587
75 4,530,598
4,530,599

CLASS 356

5 4,530,600
36 4,530,601
138 4,530,602
345 4,530,603
401 4,530,604

CLASS 357

17 4,531,142
23.6 4,531,143
71 4,531,144
81 4,531,145
82 4,531,146

CLASS 358

13 4,531,147
21 R 4,531,148
31 4,531,149
76 4,531,150
135 4,531,151
141 4,531,152
4,531,153
148 4,531,154
186 4,531,155
213 4,531,156
227 4,531,157
4,531,158
229 4,531,159
240 4,531,160

CLASS 360

10.1 4,531,161
10.3 4,531,162
33.1 4,531,164
49 4,531,163
65 4,531,165
73 4,531,166
77 4,531,167
96.1 4,531,168
98 4,531,169
119 4,531,170
130.3 4,531,171

CLASS 361

13 4,531,172
86 4,531,173
339 4,531,174
399 4,531,175
424 4,531,176
433 4,531,177

CLASS 362

158 4,531,178
297 4,531,180
371 4,531,179

CLASS 363

21 4,531,181

CLASS 364

131 4,531,182
200 4,531,184
4,531,185
300 4,531,186
412 4,531,187
422 4,531,188
431.11 4,531,190
491 4,531,191
513 4,531,192
550 4,531,189
551 4,531,193
705 4,531,194
822 4,531,195
827 4,531,196
4,531,197
900 4,531,198
4,531,199
4,531,200
4,531,201

CLASS 365

104 4,531,202
218 4,531,203

CLASS 366

79 4,530,605
129 4,530,606

CLASS 367

25 4,531,204

CLASS 368

109 4,530,607

CLASS 369

13 4,531,205
44 4,531,206
173 4,531,207

CLASS 370

7 4,531,208
56 4,531,209
100 4,531,210
102 4,531,211
4,531,212

CLASS 371

3 4,531,213
66 4,531,214
67 4,531,215

CLASS 372

9 4,531,216
50 4,531,217

CLASS 373

39 4,531,218
101 4,531,219

CLASS 374

11 4,530,608

CLASS 375

14 4,531,220
60 4,531,221
106 4,531,222
110 4,531,223
4,531,224

CLASS 376

142 4,530,812
287 4,530,813
317 4,530,814

CLASS 377

58 4,531,225

CLASS 378

143 4,531,226
144 4,531,227

CLASS 381

46 4,531,228
68 4,531,229

CLASS 382

13 4,531,230
4,531,231

CLASS 384

482 4,530,609
560 4,530,610

CLASS 400

175 4,530,611
232 4,530,612
708 4,530,613

CLASS 403

7 4,530,614
16 4,530,615
246 4,530,616
290 4,530,617

322 4,530,618
406 4,530,619

CLASS 404

121 4,530,620

CLASS 405

150 4,530,621
258 4,530,622

CLASS 407

22 4,530,623

CLASS 408

8 4,530,624
14 4,530,625

CLASS 409

10 4,530,626
80 4,530,627

CLASS 410

40 4,530,628

CLASS 411

147 4,530,629
340 4,530,630

CLASS 413

12 4,530,631

CLASS 414

35 4,530,632
414 4,530,633
534 4,530,634
627 4,530,635
730 4,530,636
750 4,530,637

CLASS 415

4 4,530,638
98 4,530,639
144 4,530,640
170 R 4,530,641

CLASS 416

119 4,530,642
144 4,530,643
175 4,530,644

CLASS 417

399 4,530,645
464 4,530,646
477 4,530,647

CLASS 419

8 4,530,815

CLASS 422

1 4,530,816
122 4,530,817
240 4,530,818

CLASS 423

112 4,530,819
219 4,530,820
238 4,530,821
242 4,530,822
260 4,530,823
328 4,530,824
344 4,530,825
376 4,530,826
575 4,530,827

CLASS 424

49 Re.31,954
61 4,530,828
70 4,530,829
71 4,530,830
89 4,530,831
92 4,530,832
4,530,833
93 4,530,834
117 4,530,835

CLASS 425

65 4,530,648
71 4,530,649
4,530,650
94 4,530,651
363 4,530,653
566 4,530,654
589 4,530,655

CLASS 426

62 4,530,846
274 4,530,847
293 4,530,848
439 4,530,849
584 4,530,850

CLASS 427

9 4,530,851
102 4,530,852
113 4,530,853
162 4,530,854
175 4,530,855
197 4,530,856
314 4,530,857
320 4,530,858
385.5 4,530,859
386 4,530,860
444 4,530,861
445 4,530,862

CLASS 428

13 4,530,863
35 4,530,864
36 4,530,865
4,530,866
41 4,530,867
57 4,530,868
69 4,530,869
95 4,530,870
111 4,530,871
200 4,530,872
253 4,530,873
266 4,530,874
283 4,530,875
4,530,876
291 4,530,652
305.5 4,530,877
326 4,530,889
334 4,530,878
352 4,530,879
402 4,530,880
421 4,530,881
452 4,530,882
503 4,530,883
608 4,530,884
670 4,530,885

CLASS 429

13 4,530,886
16 4,530,887
206 4,530,888
217 4,530,890

CLASS 430

5 4,530,891
78 4,530,892
106 4,530,893
106.6 4,530,894
145 4,530,895
155 4,530,896
302 4,530,897
403 4,530,898
551 4,530,899

CLASS 431

8 4,530,656
188 4,530,657
329 4,530,658

CLASS 432

32 4,530,659
4,530,660
106 4,530,661

CLASS 433

37 4,530,662
189 4,530,663
207 4,530,664

CLASS 434

95 4,530,665
141 4,530,666

CLASS 435

7 4,530,900
70 4,530,901
105 4,530,902
130 4,530,903
172.3 4,530,904
177 4,530,905
223 4,530,906
240 4,530,907

CLASS 436

536 4,530,908

CLASS 440

75 4,530,667

CLASS 441

76 4,530,668

CLASS 445

51 4,530,669

CLASS 446

94 4,530,670
320 4,530,671
324 4,530,672

CLASS 455

152 4,531,232
173 4,531,233
247 4,531,234
273 4,531,235
302 4,531,236
343 4,531,237
601 4,531,238
607 4,531,239
4,531,240

CLASS 464

64 4,530,673
75 4,530,674
131 4,530,675

CLASS 474

49 4,530,676
80 4,530,677
81 4,530,678
92 4,530,679
93 4,530,680
111 4,530,681
133 4,530,682
144 4,530,683
264 4,530,684

CLASS 493

151 4,530,685
309 4,530,692
315 4,530,686
342 4,530,693
361 4,530,087
409 4,530,688
410 4,530,689
425 4,530,694
442 4,530,690

CLASS 494

45 4,530,691

CLASS 501

73 4,530,909

CLASS 502

24 4,530,910
74 4,530,911
104 4,530,912
4,530,913
113 4,530,914
115 4,530,915
209 4,530,916
220 4,530,917
303 4,530,918

CLASS 514

11 4,530,838
15 4,530,920
16 4,530,836
18 4,530,837
30 4,530,921
63 4,530,922
171 4,530,839
179 4,530,840
183 4,530,923
191 4,530,924
210 4,530,841
211 4,530,925
214 4,530,926
215 4,530,927
254 4,530,928
295 4,530,929
312 4,530,930
4,530,931
318 4,530,932
344 4,530,842
416 4,530,843
425 4,530,933
453 4,530,845
458 4,530,844
548 4,530,934
613 4,530,935
749 4,530,936

CLASS 521

105 4,530,937
4,530,938
110 4,530,939
124 4,530,940
176 4,530,941

CLASS 523

118 4,530,942
318 4,530,943
335 4,530,944
400 4,530,945
418 4,530,946
450 4,530,947
454 4,530,948
512 4,530,949

CLASS 524

100 4,530,950
101 4,530,951
159 4,530,952
311 4,530,953
387 4,530,954
434 4,530,955
458 4,530,956
504 4,530,957
512 4,530,958
526 4,530,959
555 4,530,960
832 4,530,961

CLASS 525

31 4,530,962
54.1 4,530,963
61 4,530,964
67 4,530,965
89 4,530,966
4,530,967
96 4,530,968
180 4,530,969
193 4,530,970
199 4,530,971
276 4,530,972
310 4,530,973
329.4 4,530,974
403 4,530,994
423 4,530,975
440 4,530,976
443 4,530,977
528 4,530,978

CLASS 526

64 4,530,979
73 4,530,980
4,530,981
115 4,530,982
125 4,530,983
177 4,530,984
181 4,530,985
240 4,530,986
4,530,987
270 4,530,988

CLASS 528

15 4,530,989
53 4,530,990
123 4,530,991
232 4,530,992
353 4,530,993
930 4,530,995

CLASS 534

642 4,530,996
768 4,530,997

CLASS 536

24 4,530,998
30 4,530,999
4,531,000
55 4,531,001

CLASS 544

54 4,531,002
275 4,531,003

CLASS 548

112 4,531,004
116 4,531,005

CLASS 549

7 4,531,006
351 4,531,007
447 4,531,008

CLASS 560

65 4,531,009
125 4,531,010
184 4,531,011

CLASS 562

467 4,530,919

CLASS 564

295 4,531,012
428 4,531,013

CLASS 585

415 4,531,014

CLASS 604

184 4,530,695
253 4,530,696
263 4,530,697
271 4,530,698

CLASS 623

1 4,530,113
6 4,530,117
23 4,530,114
4,530,115
4,530,116

CLASSIFICATION OF DESIGNS

D2— 24 279,725
279,726
343 279,727
D3— 73 279,728
D4— 135 279,729
D6— 327 279,730
352 279,731
361 279,732
373 279,733
388 279,734
279,735
400 279,736
423 279,737
433 279,738
471 279,739
478 279,740
480 279,741
484 279,742
517 279,743
279,744
279,745
279,746
279,747
279,748
573 279,749
582 279,750
601 279,751
D7— 10 279,752
74 279,753
101 279,754
320 279,755
279,756
391 279,757
279,758
279,759
D8— 57 279,760
306 279,761
D9— 305 279,762
375 279,763
D10— 23 279,764
32 279,765
46 279,766
70 279,767
91 279,768
106 279,769
114 279,770
120 279,771
D11— 81 279,772
279,773
158 279,774
D14— 14 279,775
60 279,776
279,777
62 279,778
68 279,779
94 279,780
100 279,781
106 279,782
111 279,783
D15— 7 279,784
21 279,785
29 279,786
D16— 2 279,787
6 279,788
D17— 18 279,789
D18— 3 279,790
279,791
279,792
279,793
279,794
24 279,795
D19— 26 279,796
37 279,797
72 279,798
D20— 13 279,799
42 279,800
D21— 37 279,801
83 279,802
86 279,803
87 279,804
127 279,805
128 279,806
141 279,807
155 279,808
185 279,809
191 279,810
194 279,811
D22— 7 279,812
12 279,813
D23— 77 279,814
146 279,815
D24— 10 279,816
29 279,817
36 279,818
D26— 42 279,819
279,820
279,821
118 279,822
140 279,823
D28— 48 279,824
50 279,825
64 279,826
85 279,827
279,828
D30— 45 279,829

CLASSIFICATION OF PLANTS

P.— 7 5,518
20 5,519
51 5,520
74 5,521

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,530,504
4,530,728
4,530,840
4,531,076
02 : 4,530,127
04 : 4,530,260
4,530,262
4,530,758
4,530,863
4,531,052
4,531,081
4,531,098
4,531,120
4,531,146
4,531,165
4,531,210
4,531,215
4,531,224
05 : 4,531,179
06 : 4,530,122
4,530,131
4,530,171
4,530,197
4,530,259
4,530,267
4,530,271
4,530,272
4,530,299
4,530,340
4,530,343
4,530,345
4,530,348
4,530,363
4,530,396
4,530,397
4,530,400
4,530,409
4,530,416
4,530,420
4,530,421
4,530,432
4,530,445
4,530,450
4,530,452
4,530,478
4,530,483
4,530,486
4,530,502
4,530,519
4,530,529
4,530,531
4,530,542
4,530,559

4,530,564
4,530,574
4,530,600
4,530,602
4,530,603
4,530,627
4,530,640
4,530,663
4,530,678
4,530,685
4,530,696
4,530,697
4,530,707
4,530,712
4,530,727
4,530,752
4,530,764
4,530,765
4,530,787
4,530,812
4,530,838
4,530,920
4,531,013
4,531,015
4,531,020
4,531,021
4,531,038
4,531,087
4,531,103
4,531,112
4,531,114
4,531,128
4,531,129
4,531,131
4,531,143
4,531,144
4,531,145
4,531,167
4,531,169
4,531,171
4,531,178
4,531,182
4,531,185
4,531,216
4,531,226
4,531,231
4,531,238
08 : 4,530,173
4,530,190
4,530,196
4,530,268
4,530,364
4,530,389

4,530,468
4,530,786
4,531,101
4,531,166
4,531,201
09 : 4,530,216
4,530,245
4,530,290
4,530,291
4,530,394
4,530,408
4,530,453
4,530,539
4,530,549
4,530,565
4,530,608
4,530,617
4,530,619
4,530,635
4,530,664
4,530,676
4,530,777
4,530,792
4,530,828
4,530,867
4,530,884
4,530,886
4,530,887
4,530,942
4,530,960
4,530,986
4,531,035
4,531,214
10 : 4,530,848
4,530,922
4,530,933
4,531,010
4,531,011
11 : 4,530,652
12 : 4,530,125
4,530,221
4,530,229
4,530,239
4,530,240
4,530,310
4,530,351
4,530,368
4,530,395
4,530,467
4,530,497
4,530,505
4,530,523
4,530,584

4,530,657
4,530,830
4,530,862
4,530,890
4,531,068
4,531,127
13 : 4,530,178
4,530,417
4,530,548
17 : 4,530,132
4,530,141
4,530,156
4,530,177
4,530,219
4,530,242
4,530,264
4,530,276
4,530,295
4,530,318
4,530,321
4,530,331
4,530,342
4,530,344
4,530,349
4,530,354
4,530,370
4,530,376
4,530,405
4,530,426
4,530,435
4,530,446
4,530,472
4,530,499
4,530,500
4,530,525
4,530,537
4,530,545
4,530,546
4,530,558
4,530,563
4,530,607
4,530,653
4,530,690
4,530,691
4,530,699
4,530,701
4,530,813
4,530,912
4,530,913
4,530,936
4,530,937
4,530,938
4,530,977

4,530,988
4,531,025
4,531,046
4,531,071
4,531,118
4,531,122
4,531,175
4,531,234
4,531,235
18 : 4,530,308
4,530,423
4,530,427
4,530,498
4,530,555
4,530,659
4,530,729
4,530,878
4,530,900
4,530,904
4,531,018
4,531,028
4,531,072
4,531,106
4,531,109
4,531,115
4,531,174
4,531,176
19 : 4,530,230
4,530,648
4,531,027
4,531,233
20 : 4,530,406
4,530,511
4,530,928
21 : 4,530,713
4,531,134
22 : 4,530,915
23 : 4,530,700
24 : 4,530,138
4,530,214
4,530,356
4,530,359
4,530,379
4,530,473
4,530,482
4,530,698
4,530,804
4,530,908
4,530,935
4,531,061
4,531,066
4,531,083
4,531,084

4,531,195
25 : 4,530,111
4,530,120
4,530,357
4,530,451
4,530,518
4,530,577
4,530,706
4,530,710
4,530,750
4,530,816
4,530,881
4,530,896
4,530,898
4,530,905
4,530,944
4,531,055
4,531,058
4,531,059
4,531,078
4,531,088
4,531,113
4,531,160
4,531,177
26 : 4,530,126
4,530,142
4,530,144
4,530,162
4,530,181
4,530,218
4,530,226
4,530,231
4,530,274
4,530,332
4,530,352
4,530,411
4,530,412
4,530,413
4,530,487
4,530,493
4,530,540
4,530,609
4,530,637
4,530,638
4,530,642
4,530,660
4,530,673
4,530,767
4,530,795
4,530,835
4,530,872
4,530,882
4,530,929

4,530,939
4,530,957
4,530,973
4,530,976
4,530,979
4,531,004
4,531,006
4,531,044
4,531,048
4,531,064
27 : 4,530,183
4,530,188
4,530,193
4,530,232
4,530,244
4,530,388
4,530,461
4,530,463
4,530,543
4,530,572
4,530,686
4,530,721
4,530,854
4,530,859
4,530,879
4,531,141
4,531,200
4,531,213
28 : 4,530,688
29 : 4,530,179
4,530,466
4,530,515
4,530,579
4,530,625
4,530,680
4,530,684
4,530,703
4,530,789
31 : 4,530,167
4,530,832
33 : 4,531,130
34 : Re.31,954
4,530,149
4,530,154
4,530,163
4,530,298
4,530,353
4,530,367
4,530,442
4,530,447

4,530,536
4,530,568
4,530,573
4,530,674
4,530,687
4,530,714
4,530,722
4,530,739
4,530,755
4,530,756
4,530,757
4,530,770
4,530,790
4,530,793
4,530,801
4,530,805
4,530,839
4,530,841
4,530,844
4,530,921
4,530,987
4,531,016
4,531,024
4,531,056
4,531,102
4,531,105
4,531,110
4,531,149
4,531,152
4,531,154
4,531,187
4,531,208
4,531,209
36 : 4,530,117
4,530,129
4,530,168
4,530,176
4,530,182
4,530,211
4,530,265
4,530,270
4,530,361
4,530,422
4,530,528
4,530,592
4,530,671
4,530,718
4,530,726
4,530,734
4,530,736

4,530,772
4,530,784
4,530,788
4,530,802
4,530,808
4,531,047
4,531,067
4,531,137
4,531,181
4,531,199
37 : Re.31,952
4,530,136
4,530,301
4,530,509
4,530,735
4,530,763
4,530,778
4,530,800
4,531,051
38 : 4,530,429
39 : Re.31,953
4,530,118
4,530,143
4,530,166
4,530,195
4,530,306
4,530,350
4,530,373
4,530,437
4,530,438
4,530,439
4,530,441
4,530,448
4,530,455
4,530,469
4,530,496
4,530,533
4,530,556
4,530,631
4,530,654
4,530,675
4,530,741
4,530,742
4,530,860
4,530,861
4,530,883
4,530,919
4,530,959
4,530,984
4,530,995

4,531,029
4,531,042
4,531,045
4,531,085
4,531,139
4,531,218
40 : 4,530,273
4,530,305
4,530,372
4,530,398
4,530,402
4,530,538
4,530,606
4,530,630
4,530,738
4,530,968
4,530,982
4,531,189
41 : 4,530,247
4,530,258
4,530,369
4,530,679
4,530,702
42 : 4,530,112
4,530,139
4,530,170
4,530,189
4,530,213
4,530,215
4,530,233
4,530,235
4,530,261
4,530,269
4,530,279
4,530,286
4,530,393
4,530,431
4,530,434
4,530,456
4,530,491
4,530,501
4,530,508
4,530,552
4,530,560
4,530,569
4,530,611
4,530,629
4,530,723
4,530,730
4,530,731

4,530,766
4,530,856
4,530,876
4,530,877
4,530,889
4,530,931
4,530,945
4,530,965
4,531,012
4,531,030
4,531,031
4,531,070
4,531,075
4,531,104
44 : 4,530,562
45 : 4,530,250
4,530,444
4,530,510
4,530,666
4,530,874
46 : 4,530,288
47 : 4,530,130
4,530,355
4,530,460
4,530,522
4,530,853
4,530,997
4,531,017
4,531,077
4,531,192
48 : 4,530,121
4,530,161
4,530,174
4,530,228
4,530,234
4,530,238
4,530,275
4,530,302
4,530,377
4,530,385
4,530,392
4,530,399
4,530,401
4,530,485
4,530,488
4,530,507
4,530,526
4,530,601
4,530,645
4,530,646

4,530,689
4,530,704
4,530,749
4,530,911
4,530,914
4,530,941
4,530,948
4,530,974
4,531,091
4,531,093
4,531,180
4,531,186
4,531,204
49 : 4,530,480
4,530,516
4,530,855
4,531,001
4,531,073
4,531,121
51 : 4,530,223
4,530,309
4,530,476
4,530,814
4,530,833
4,531,023
4,531,196
4,531,197
4,531,229
53 : 4,530,175
4,530,180
4,530,443
4,530,524
4,530,632
4,530,634
4,530,705
4,530,719
54 : 4,530,981
55 : 4,530,248
4,530,307
4,530,317
4,530,419
4,530,459
4,530,492
4,530,667
4,530,692
4,530,781
4,530,782
4,530,834
4,530,846
4,531,117

DESIGN PATENTS

01 : 279,776
279,785
06 : 279,734
279,735
279,751
279,763
279,782
279,783
279,797
279,800
279,807

279,808
279,809
279,813
279,814
279,816
279,817
279,822
279,829
09 : 279,803
12 : 279,743
279,744

279,745
279,746
279,747
279,748
17 : 279,731
279,758
279,759
279,779
279,799
18 : 279,730
279,784

20 : 279,753
23 : 279,737
24 : 279,818
25 : 279,738
279,769
26 : 279,727
279,740
27 : 279,736
29 : 279,764
34 : 279,725
279,726

279,732
279,742
36 : 279,729
279,741
279,755
279,756
279,757
279,777
279,806
279,789
39 : 279,761

279,802
41 : 279,792
279,793
279,794
42 : 279,768
279,770
48 : 279,796
279,812
279,823
49 : 279,739

PLANT PATENTS

06 : 5,518
17 : 5,521
45 : 5,520

U.S. GOVERNMENT PRINTING OFFICE : O—1985

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO:

@ $ Domestic; @ $ Foreign.

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402

U.S. DEPARTMENT OF COMMERCE
Malcolm Baldrige, Secretary
PATENT AND TRADEMARK OFFICE
Donald J. Quigg, Acting Commissioner